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# The New international year book

**THE NEW  
INTERNATIONAL  
YEAR BOOK**

==  
**A COMPENDIUM OF THE WORLD'S  
PROGRESS  
FOR THE YEAR  
1916**

**EDITOR  
FRANK MOORE COLBY, M. A.**

**ASSOCIATE EDITORS  
ALLEN LEON CHURCHILL  
WILLIAM DUNN CONKLIN**

**NEW YORK  
DODD, MEAD AND COMPANY  
1917**

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*Mrs. T. W. Richards,  
Cambridge*

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## PREFACE

The present volume of the **NEW INTERNATIONAL YEAR BOOK**, the tenth in the series that began with the 1907 issue, runs to more than the usual length owing to the necessity of treating in adequate detail the Presidential Campaign and Election. Ten years' experience have presented no reason for modifying in essentials the plan of the **YEAR BOOK** and it continues to aim at comprehensive rather than specialized treatment and to preserve the alphabetical order of presentation as best suited to a general work of reference, designed for all classes of readers. The title list this year has been extended as a result of the more thorough developments of the cross reference system. Another improvement over previous issues is the expansion of the biographical department, which now includes a wider range and a more complete treatment of biographies pertaining to the year than can be found in any other single work. Aside from the Presidential Campaign the dominant article in the **YEAR BOOK** continues to be the review of the War in Europe, which, as in the two preceding issues, has been prepared by Professor Carlton Hayes. The relations of the United States to the War are discussed separately as before under the title, **UNITED STATES AND THE WAR**. The present number contains an unusually comprehensive discussion of economic and social topics such as **ARBITRATION AND CONCILIATION, BANKS, FINANCIAL REVIEW, LABOR, STRIKES AND LOCKOUTS, CHARITIES, COÖPERATION, WELFARE WORK, WORKINGMEN'S COMPENSATION, PENOLOGY, TAXATION, CHILD LABOR, PRICES**, etc. The unprecedented extent to which engineering skill has been applied to the work of destruction appears in such articles as **MILITARY PROGRESS, NAVAL PROGRESS, BATTLESHIPS, and SUBMARINES** in which the technical developments as regards *matériel* are related, and under **SHIPPING** are described and enumerated the losses inflicted on the merchant fleets of both Allied and neutral nations. The article **SHIPBUILDING** is of interest as showing the efforts made to make good these losses, while **CHEMISTRY, INDUSTRIAL** records what was being done to relieve disturbed manufacturing conditions and shortage of supply by improved processes and by new materials.

FRANK MOORE COLBY.



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**NOTE:** CROSS references in **SMALL CAPITALS** indicate that the allusion is to a separate article; cross references in *italics* denote that the reference is to a subdivision of a main article. A cross reference in *italics*, standing alone in an article, carries the reference to another subdivision of the same article. The letters q. v. (*quod vide*—Latin “which see”) in parentheses following a word, indicate that the subject is treated under its own name elsewhere in the volume.

**NOTE:** In certain tables in this work it will be found, by addition, that the totals do not correspond to the sum of the items. This is the result of the omission or inclusion of certain small items which are not mentioned in the table, but are included in the totals. This is a usage frequently employed in the compilation of government statistics, from which sources the greater number of the tables in the **YEAR BOOK** are taken.

# THE NEW INTERNATIONAL YEAR BOOK

**A**BBE, CLEVELAND. An American meteorologist, "father of the United States Weather Bureau," died at Chevy Chase, near Washington, D. C., Oct. 28, 1916. He was born in New York City in 1838, graduated at the Free Academy (now College of the City of New York) in 1857, and afterward studied under distinguished astronomers at Ann Arbor, Mich., and at Cambridge, Mass., and resided at the Pulikova Observatory, Russia. After returning to the United States Dr. Abbe became director of the Cincinnati Observatory in 1868. For four of the five years that he held this post, he published daily weather forecasts, the first that had been given the public officially. The United States government soon afterward inaugurated a similar system, and called Dr. Abbe to prepare weather predictions and storm warnings, first as assistant to Gen. A. J. Myer, who had been chief signal officer of the army, and, from 1891, as meteorologist of the Weather Bureau. Under his direction were the published "probabilities" issued every three days, beginning in February, 1871; they gained for the anonymous author the name of "Old Probs." For many years Dr. Abbe edited the official *Monthly Weather Review*, and in 1909-13 he was also editor of the *Bulletin of the Mt. Weather Research Observatory*. In addition, he lectured at Johns Hopkins and was a professor at George Washington University. Among the honors that came to him were degrees of LL.D. from the University of Michigan and Glasgow University, membership in the National Academy of Sciences, and the Symons gold medal of the Royal Meteorological Society of Great Britain (1912). To Dr. Abbe is to be credited initiation of the movement for the adoption of systems of standard time and hourly meridians, and efforts that advanced the study of ocean meteorology, the prediction of river floods, the requirement of civil service examinations in meteorology, and other improvements in the service. Besides early meteorological works, he published: *The Mechanics of the Earth's Atmosphere* (3 vols., 1891-1911); *Physical Basis of Long Range Forecasting* (1902); *Relations between Climates and Crops* (1905). Professor Abbe had charge of the department of meteorology in the NEW INTERNATIONAL ENCYCLOPEDIA.

**ABKAEH.** See ARCHÆOLOGY.

**ABORTION, CONTAGIOUS.** See VETERINARY MEDICINE.

**ABYSSINIA (ETHIOPIA),** An absolute mon-

archy under a Christian sovereign—an empire composed of the kingdoms of Gojam, Shoa, Tigré, and Amhara, together with territories and dependencies whose chiefs are subject to the emperor. Addis Abeba, the capital, with between 60,000 and 80,000 inhabitants, was founded by Menelek in 1892. The population, variously estimated (8,000,000 is a figure quoted by several authorities), consists of Abyssinians (about half, who mainly profess a Coptic Christianity—monophysitism), Gallas (Mohammedans), Somalis, Falashas, and some negroes.

Grazing is the leading industry; a primitive agriculture is practiced, the soil yielding two and in some cases three crops yearly. Minerals exist in exploitable quantities. Imports through Jibuti amounted in 1911 to 22,708,001 francs, and in 1912 to 19,443,561; exports, to 18,974,926 francs in 1911 and 19,163,737 in 1912. Imports by way of Eritrea (1911), 2,320,558 lire; exports, 3,072,100. By way of the Egyptian Sudan: 1911 imports, £E40,925; 1912, £E34,280; 1911 exports, £E75,509; 1912, £E38,720. The principal articles of export through Jibuti, with value in 1912, are skins (7,663,000 francs), coffee (6,994,000), ivory (2,152,000), wax (1,248,000), rubber (389,000). The value of imports and exports through Jibuti in 1913 is given by a British authority at £736,848; through Gambela and Western Abyssinia to the Sudan, £127,647; through Somaliland, £61,700. A railway (constructed entirely by French capital) from Jibuti to Diré Dawa (187 miles) was opened in 1902; and an extension to Addis Abeba is in process of building. Telegraph and telephone lines connect Addis Abeba with Harar; and telegraphic communication exists with adjacent French and Italian colonies.

Prince Kassai of Tigré resumed the old title *negus negusti* after the overthrow by the British of Theodore, King of Amhara, in 1868; and reigned as emperor of Ethiopia until his death in 1889, when he was succeeded by Menelek II, King of Shoa. He proclaimed his grandson, Lidj Yasu, heir to the throne, and consequent upon his prolonged illness his heir took over the duties of emperor in 1910. Upon the death of Menelek in 1913, Lidj Yasu succeeded to the throne. The principal divisions with their rulers follow: Harar, with dependencies, Dejazmatch Taffari; Wollo, Mikael; Kassa and Magi, Dezejatch Katama; Goré, Dejazmatch Ganami; Tigré, Ras Seyown; Damot and Gojam, Ras Hailu; Equatorial Provinces, Fitawari Hapta Giorgis; Gondar, Ras Wolde Giorgis; Jima, Aba Giffar.

It was announced on Sept. 30, 1916, that Lidj Yasu had been deposed and was to be succeeded on the throne by his aunt, Ouizero-Zeoditu. This was followed by reports of disaffection among the followers of his father, Ras Michael, which resulted in a rebellion of a serious nature. The movement was especially strong in the interior of the country, where Michael's influence was extensive, but according to dispatches of October 30th, he was defeated and captured in a battle fought in the neighborhood of Addis Abeba, and in November it was reported that the revolution was under control. This relieved the Allies of much apprehension, especially Italy, which feared for the safety of Erythra. On the other hand the Central Powers had hoped that the movement would spread with the result of drawing troops of the Allies from Europe to protect northern Africa.

**ACADEMY, FRENCH (ACADÉMIE FRANÇAISE).** A body of distinguished men of letters, founded in 1635 by Cardinal Richelieu, the Academy was reorganized in 1816. It is the most famous of the five academies which comprise the Institute of France: the French Academy, the Academy of Inscriptions and Belles-Lettres, the Academy of Sciences, the Academy of Fine Arts, and the Academy of Moral and Political Sciences. The French Academy is the arbiter in disputed literary matters and its members are known as the Forty Immortals. At the end of 1916 there were 10 vacancies, the following having died during the year: Emile Faguet, Marquis Pierre de Ségur, Marquis de Vogüé, and Francis Chalmers (q.v.). The secretary of the Academy, who holds his position for life, is Etienne Lamy. The members in the order of their election, are as follows: Othenin P. de Cléron, Comte d'Haussonville; Charles Louis de Saules de Freycinet; Louis Marie Julien Viaud (Pierre Loti); Ernest Lavisse; Paul Bourget; Jacques Anatole Thibault (Anatole France); Gabriel Hanotaux; Henri Léon Emile Lavedan; Paul Deschanel; Edmond Rostrand; Frédéric Masson; René Bazin; Etienne Lamy; Alexandre F. J. Ribot; Maurice Barrès; Maurice Donnay; Jean Richepin; Raymond Poincaré; Eugène Brieux; Jean Aicard; René Doumie; Marcel Prévost; Monseigneur Louis Marie Duchesne; Henri de Régnier; Denys Cochin; General Hubert Lyautey; Emile Boutroux; Alfred Capus; Pierre de la Gorce; Henri Bergson.

**ACADEMY OF ARTS AND LETTERS, AMERICAN.** A body of writers, artists, and composers, limited in number to 50, chosen from among themselves by the 250 members of the National Institute of Arts and Letters. The Institute had its origin at a meeting of the American Social Science Association in 1898. The Academy was founded in 1904 with William Dean Howells as its president. Mr. Howells has since continued to hold this office. In some respects the Academy is modeled on the French Academy. It and the Institute meet together annually, the last such meeting taking place in New York, Nov. 16-17, 1916. Within the year two new members, Barrett Wendell and Gari Melchers were elected members, to take the places of James Whitcomb Riley and Henry James (q.v.), deceased. The seat of William Merritt Chase (q.v.) is vacant. On Nov. 24, 1916, the membership list was as follows: William Dean Howells, Henry Adams, Theodore Roosevelt, John Singer Sargent, Daniel Chester

French, John Burroughs, James Ford Rhodes, Horatio William Parker, William Milligan Sloane, Robert Underwood Johnson, George Washington Cable, Andrew Dickson White, Henry van Dyke, William Crary Brownell, Basil Lanneau Gildersleeve, Woodrow Wilson, Arthur Twining Hadley, Henry Cabot Lodge, Edwin Howland Blashfield, Thomas Hastings, Hamilton Wright Mabie, Brander Matthews, Thomas Nelson Page, Elihu Vedder, George Edward Woodberry, Kenyon Cox, George Whitefield Chadwick, Abbott Handerson Thayer, Henry Mills Alden, George de Forest Brush, William Rutherford Mead, Bliss Perry, Abbott Lawrence Lowell, Nicholas Murray Butler, Paul Wayland Bartlett, Owen Wister, Herbert Adams, Augustus Thomas, Timothy Cole, Cass Gilbert, William Roscoe Thayer, Robert Grant, Frederick MacMonnies, Julian Alden Weir, William Gillette, Paul Elmer More, George Lockhart Rives, Barrett Wendell, and Gari Melchers.

The first seven members were: William Dean Howells, Augustus Saint-Gaudens, Edmund Clarence Stedman, John La Farge, Samuel Langhorne Clemens, John Hay, and Edward MacDowell. William Milligan Sloane is chancellor and treasurer of the Academy, and Robert Underwood Johnson, 70 Fifth Avenue, New York City, is permanent secretary.

**ACADEMY OF SCIENCES, NATIONAL.** A body of distinguished American scientists, incorporated in 1863. Its purpose is "Whenever called upon by any department of the government, to investigate, examine, experiment, and report upon any subject of science or art." At the end of 1916 there were 147 members and 40 foreign associates. The officers were as follows: president, William H. Welch; vice-president, Charles D. Walcott; foreign secretary, George E. Hale; home secretary, Arthur L. Day; treasurer, Whitman Cross. In 1916, as the result of a movement of the Academy to mobilize the nation's science for industrial progress and military efficiency, a National Research Council was established. The chairman of the council is John J. Carty, chief engineer of the American Telephone and Telegraph Company, and a former president of the American Institute of Electrical Engineers. Drs. W. H. Welch and G. E. Hale investigated, in England, the effect of the war on scientific research and industrial progress. Within the year the Academy completed an investigation of the Panama Canal slides.

**ACCIDENT INSURANCE.** See SOCIAL INSURANCE; WORKMEN'S COMPENSATION.

**ACCIDENTS.** See RAILWAY ACCIDENTS; WORKMEN'S COMPENSATION.

**ACHURCH, JANET.** An English actress, died at Ventnor, Sept. 11, 1916. Her real name was Janet Achurch Sharp and she was married to Charles Charrington. Born in Lancashire in 1864, she made her London début in 1883, joined Beerbohm Tree's company in 1887, and two years later became manager of the Novelty Theatre. Here she presented *A Doll's House*, the first Ibsen play seen by the English public. In it she created the part of Nora, gaining thereby a remarkable reputation. Later she toured India and Australia, and in the United States, in 1895, she played with Richard Mansfield. Between 1897 and 1911, her more important rôles were: Cleopatra in *Antony and Cleopatra*, Candida in Shaw's play of that name and Lady Cicely in his *Captain Brassbound's*

*Conversion*, Hermione in *Andromache*, Queen Katharine in *King Henry VIII*, Merete Beyer in *The Witch*, Mrs. Alving in *Ghosts*, and Rita Allmers in *Little Eyolf*.

**ACTIVATED SLUDGE.** See SEWERAGE.

**ADAMSON LAW.** See ARBITRATION AND CONCILIATION, INDUSTRIAL; RAILWAYS; UNITED STATES, *Presidential Campaign*.

**ADDAMS, JANE.** See LITERATURE, *Feminism*; WOMAN MOVEMENT.

**ADEN.** A peninsula and a small strip of coast in southwestern Arabia, forming a part of the Bombay Presidency of British India. The area is 75 square miles, or with the island of Perim 80 square miles. Population in 1911, 46,165, the increase over 1901 being 5 per cent. The town of Aden is an important coaling and trans-shipment station and is strongly fortified. Trade (which is largely transit) in 1914-15, exclusive of government stores and treasure: Imports of merchandise by sea, £3,127,652; by land, £136,409; exports by sea, £2,607,965; by land, £115,481; total imports and exports of treasure, £411,948 and £540,154. In 1914-15, 1204 merchant vessels, of 3,058,771 tons (net) were entered at the port of Aden. Socotra and the Kuria Muria islands are administratively attached to Aden. The Turks in 1915 had sent troops into the eastern part of the Aden Protectorate for the purpose of stirring the natives to revolt, but on July 12, 1916, a British column attacked a Turkish force near Subar, inflicting severe losses on it, and after this it was reported that conditions were normal.

**ADMINISTRATION, COLLEGE AND UNIVERSITY.** See UNIVERSITIES AND COLLEGES.

**ADMISSION REQUIREMENTS, COLLEGE.** See UNIVERSITIES AND COLLEGES.

**ADVANCEMENT OF SCIENCE, AMERICAN ASSOCIATION FOR THE.** With 50 other societies in session at the same time, and in the same city, the American Association met in New York for its 69th annual meeting, Dec. 26-30, 1916. About 2100 of the 12,000 members were registered as present. Headquarters were made at Columbia University, where many of the meetings were held, but halls in various other institutions and in hotels were also used. The convocation, which was the first of quadrennial gatherings that are to be held successively in New York, Chicago, and Washington (with the usual annual meetings between), was the largest assemblage of scientific men ever recorded. Over the opening session, held in the American Museum of Natural History, Dr. Charles R. Van Hise, president of the University of Wisconsin, presided. Dr. William Wallace Campbell, director of the Lick Observatory, and retiring president of the Association, addressed the members on "The Nebulæ," using a notable collection of slides. There were later two public lectures, open to the people of the city, one by Dr. Simon Flexner of the Rockefeller Institute, on "Infantile Paralysis and the Public Health," and one by Dr. A. A. Noyes, of the Massachusetts Institute of Technology, on "Nitrogen and Preparedness." The problems of preparedness, from different aspects, and of national economy and conservation of resources were dealt with by a number of speakers. Among subjects which were intended to attract general rather than specialized scientific interest were: "Biology and National Existence"; "The Structure of Matter"; "The Relations of Chemistry to

Botany"; "The Adjustment of Science to Practice in Agriculture"; "Cancer and its Control"; "Highway Engineering." After its opening session, the Association broke up into its 12 sections. Addresses were made by the retiring vice-presidents, who included: Armin O. Leuschner, E. Percival Lewis, William McPherson, Bion J. Arnold, W. A. Setchell, Lillian J. Martin, George F. Kunz, who spoke on "Scientific Efficiency and Industrial Museums Our Safeguard in Peace and War," and Ellwood P. Cubberley.

The Council of the Association endorsed a resolution advocating greater use of the metric units of weight and measure in the United States. Dr. Kunz, who had been prominent in this movement, was elected president of a new society, the American Metric Association. Under the auspices of the great engineering societies, a meeting was held to discuss the interrelations of engineering and pure science. Dr. Henry M. Howe presided, and the speakers were Bion J. Arnold, past president of the American Institute of Electrical Engineers, Clemens Herschel, president of the American Society of Civil Engineers, and Dr. Ira D. Hollis, president of the American Society of Mechanical Engineers.

The Committee of One Hundred on Scientific Research heard a report from Dr. Raymond Bacon of the Mellon Institute, chairman of the committee on industrial research. It was announced that through the Colburn bequest the research funds of the Association have been increased to \$110,000. It was also announced that about 5000 members of affiliated societies had become Association members in 1916 and that the initiative of Prof. H. L. Fairchild had resulted in the establishment of a local branch of the Association in Rochester. Besides a permanent secretary, who is L. O. Howard, there is now a general secretary, Prof. J. McKeen Cattell of Columbia having been elected to this office for a five-year term. Dr. Theodore W. Richards, director of the Wolcott Gibbs Memorial Laboratory at Harvard and winner of the Nobel prize in chemistry, was elected to preside at the next meeting, which will be held in 1917 in Pittsburgh, and to give the address the following year at Boston. The following were elected vice-presidents: W. J. Humphreys (Physics), W. A. Noyes (Chemistry), George H. Perkins (Geology and Geography), Herbert Osborn (Zoölogy), Burton E. Livingston (Botany), Edward B. Titchener (Anthropology and Psychology), George W. Perkins (Social and Economic Science), C.-E. A. Winslow (Physiology and Experimental Medicine), E. F. Buchner (Education), and H. J. Waters (Agriculture). See also AGRICULTURE.

**ADVANCEMENT OF SCIENCE, BRITISH ASSOCIATION FOR THE.** The 86th annual meeting of the Association, held at Newcastle-on-Tyne September 5th-9th, was notable for discussions of a practical character relating to problems arising from the war. After the first general session, at which the retiring president, Sir Arthur J. Evans, spoke on "New Archæological Lights on the Origins of Civilization in Europe," the Association broke up into its 13 sections. The presidents of sections who delivered addresses were: Prof. A. W. Kirkaldy (Economic Science and Statistics), who discussed reconstruction after the war; Gerald

Stoney (Engineering); Rev. R. Temple (Educational); Dr. E. J. Russell (Agriculture), who spoke on increased crop production, and one of whose suggestions was answered by Sir Sydney Olivier, Secretary of the Board of Agriculture and Fisheries, who said that the board expected to establish agricultural engineering institutions; Prof. G. G. Henderson (Chemical); Prof. W. S. Bolton (Geology); Prof. A. N. Whitehead (Mathematical and Physical); Prof. Cushny (Physiological); Dr. E. B. Rendle (Botanical); and Edward A. Reeves (Geography). Aside from the presidential addresses, a few others may be noted. Sir John S. Maxwell lectured on afforestation, recommending that Great Britain be made self-sufficient as regards lumber supply. The Economics Section discussed outlets for labor after the war, especially with relation to the replacement of male by female labor; they took up also the effect of the war on credit, currency, and finance. Sir T. H. Holdich spoke before the Geographical Section on political frontiers. The Chemical and Engineering Sections together considered the conservation of coal resources. The Hon. Sir Charles Parsons, famous for his turbine engine, is the president of the British Association for 1917, when the meeting will be held at Bournemouth. See also AGRICULTURE.

**ADVENT CHRISTIANS.** See ADVENTISTS.

**ADVENTISTS.** The Seventh Day Adventists, the largest branch of this denomination, had, on Dec. 31, 1915, a total membership of 136,879, a net gain of 11,035 over 1914. The number baptized in 1915 was 17,438. Of the total membership the North American Division, including the United States and Canada, had 77,735; European Division, 37,617; Asiatic Division, 9746; South American Division, 4903; Miscellaneous Union Conferences, 6878. The North American Division had 2113 churches, 9624 persons baptized in 1915, 582 ordained ministers, 640 licensed missionaries, and 2339 evangelistic and institutional laborers. Its tithes contributions were \$1,337,810; foreign missions and other offerings, \$1,204,872; total, \$2,542,682. The total contributions of the denomination in 1915 were \$3,407,298, of which \$1,968,168 were tithes, \$872,666 foreign offerings, and \$566,463 other offerings. Church buildings and property are valued at \$14,254,615. There are 40 publishing houses. Other branches of the denomination are: Advent Christians, about 26,000 communicants, 550 churches, 528 ministers; the Church of God, about 600 communicants, 20 churches, 32 ministers; the Life and Advent Union, 509 communicants, 12 churches, and 12 ministers in 1914; and the Church of God in Jesus Christ, 2224 communicants, 68 churches, and 61 ministers in 1914.

**AERONAUTICS.** The aeronautical record for 1916 once more is concerned chiefly with military preparation and achievement, with the combative side increasingly prominent. Scientifically, technically, and industrially, every effort in both belligerent and neutral countries was being expended in increasing the efficiency and supply of the military and naval aeroplanes, so that much in this field must be considered in connection with the articles on MILITARY PROGRESS, and WAR OF THE NATIONS, to which the reader is accordingly referred.

There are, however, certain salient features that have been learned as regards European

practice and are discussed in the technical and other journals of the year, as well as developments and notable achievements in the United States that may figure in the usual record under the present title. Everywhere designers and builders were anxious to develop any promising ideas, and as soon as an aeroplane or airship was shot down or captured it was subject to minute study by the enemy's aerial experts. In this they were probably aided by information received from spies and careful observation of the flight and tactics of the hostile aircraft. Imitation of design was charged against the Germans, but their aeroplanes captured showed a wonderful unity of design, the elimination of useless features, and the perfection of useful elements and appliances. On the other hand, the ingenuity and versatility of the French in design and construction continued, while Great Britain was manufacturing approved types on an extraordinarily extensive scale. The work of the American manufacturers began to stand out preëminent, especially on the side of powerful motors and large aeroplanes, about which, however, there was comparatively little general information.

So far as the technology of aviation is concerned the efforts of designers, engineers, and practical aviators have been devoted to supplying to the warring nations more efficient machines. The result has been intense rivalry between the Entente and the Central Powers no less in laboratory and factory than in the field itself. The Entente Allies have had the advantage of being able to draw from the United States motors and machines to supplement their own types and constructions, while the Teutons, though handicapped by inferior resources, have acquitted themselves well. Thus in the early part of the year on the western front the Fokker monoplanes, which were claimed to be modified copies of the French Morane-Saulnier machines, by their fine fighting qualities aided materially in contributing to what was considered for a time German superiority in the air. But the ingenious Bleriot responded with a swift flexible monoplane known as the "Spad," which, with powerful engines, was able to outfly its adversaries, while other powerful machines were built, some of which were designed with such great lifting power and stability that they could mount guns of substantial size. Aerial combat continued to develop in importance as a function of the aeroplane. In all services the tractor biplane continued to be standard for all work except high speed observation.

In engine construction the general tendency was towards the fixed cylinder water-cooled engine in place of the air-cooled rotary engine, which was in favor before the war, especially in France. The enormous quantities of water and oil required by the lighter rotary added to the net weights of the machines, and accordingly in both France and Germany recourse was had to the automobile engineers, and efficient water-cooled six, eight, and twelve cylinder motors appeared, built in the main along similar lines to those used in racing cars. Thus the Mercedes motor of the Germans as used in 1916 was an efficient six-cylinder motor of 5.5-inch bore and 6.29-inch stroke developing 178 horse power at 1450 revolutions per minute. It was made of the strongest materials, so possessed reasonable lightness with strength.

Where power and weight-carrying capacity was demanded the fixed cylinder type was essential, but here the intensity of heat from the exploded gasoline limited the size of the pistons. Accordingly their number was increased and when more than six were used the "V"-motor with eight and then with 12 cylinders followed.

A new motor used extensively during the year was the Hispano Suiza, 1800 of which were ordered by the French government within a single month. This engine weighed but 2.42 pounds per horse power and developed 150 horse power. The American rights of manufacture were secured by the Wright and Martin Aircraft Corporation.

The Fokker monoplane employed the Oberussel nine cylinder air-cooled rotary motor, being the only German aeroplane with such a type of engine. The Gnome motor was still used on some French monoplanes, but here as in Germany and England the fixed cylinder type prevailed.

It was not generally realized that coincident with the progress seen in Europe there was taking place in the United States a free and untrammelled development of aeroplane motors. In America conditions purely commercial encouraged independent effort, and as a result there had been evolved a number of types, far more than in any single European country. It was reported that at the end of 1916 there were a dozen different types of motors ranging between 125 and 400 horse power and as many or more between 80 and 125 horse power. The United States had developed at least one type of aeroplane capable of a speed of 125 miles and another that would lift 15 tons. Power was available in all American machines, but the most usual criticism of the foreign purchasers was the lack of finish to which European mechanics have been trained.

It was reported in Great Britain that in the summer of 1916 there were not less than 500,000 people in the British air service. This included a large number of non-combatants, such as mechanics and others engaged in the manufacture of aeroplanes and aeroplane supplies. It was also stated that Great Britain was spending nearly \$250,000,000 in aeronautics in 1916 and a substantial amount was for machines and appliances of American manufacture.

In Parliament and elsewhere there was criticism of the Royal Naval Air Service and the Royal Flying Corps, and with the alleged failure of the Derby Committee to provide adequate flying equipment there was a demand for an air ministry with independent power and responsibility. There was an investigation of the Royal Aircraft Factory at Farnborough and various improvements were suggested, but commercial aeroplane firms were encouraged to manufacture the government 'planes, and from these the greater part of the war 'planes used in the British service were secured. At the end of the year Lord Cowdray, the head of the great Pearson Company, succeeded Lord Curzon as head of the Air Committee.

Naturally few new developments in Europe escape the military authorities and the censors, but a striking instance reported from England was a large flying boat made in America with wing span of over 130 feet, and powered with engines of 1000 horse power. This aeroplane with eight passengers and 600 gallons of gaso-

line was able to make a speed of over 75 miles an hour. The eight passengers were carried in an ample cabin protected from the weather. Another report from England was of a huge land aeroplane which, with 21 passengers, was able to rise to 7000 feet.

One of the more powerful American motors put out during the year was the Knox 300 horse power aeronautic engine, supplied with 12 cylinders, "V"-type, 4 $\frac{1}{4}$ -inch bore by 7-inch stroke. This engine, with its appurtenances, weighed complete 1400 pounds and would give 300 horse power with the throttle half open, leaving a substantial reserve for high altitudes.

The tendency towards providing increased power was shown in changes and improvements in the Curtiss 5x7 eight cylinder VX motor, which was rated at 160 horse power. This motor was developed to a point where it would yield in excess of 200 horse power and was accordingly rated at that figure. It was then known as the VX-3 motor and was used in the aeroplane employed by Victor Carlstrom in his flight from Chicago to Erie, Pa., on November 2nd, 452 miles in 3 hours and 57 minutes being accomplished.

Not only increased power but increased reliability was secured, and while many machines were equipped with double motors and propellers, the Curtiss twin motored tractor was able to fly and climb with one motor alone, and thus had double assurance against mishap in the event of failure of one of the engines. This biplane, so engine, was used by Victor Carlstrom. When fitted with pontoons he flew it 661 miles in 8 $\frac{1}{2}$  hours in flights for the Curtiss Marine Trophy, this mileage standing as the record in this contest up to the end of 1916.

The importance of the American aeroplane industry was shown by the organization of the Wright-Martin Aircraft Corporation to take over the stock of the Wright Company, the Glenn L. Martin Company, and other corporations. This corporation, which had a capital of \$5,000,000 preferred stock in addition to 500,000 shares common stock of no par value, was giving employment during the year to 2362 men. Another indication of the highly developed status of aeroplane manufacture was the fact that the Curtiss Aeroplane and Motor Corporation maintained an engineering department with a force of 150 men and occupying drafting rooms and laboratories covering a floor space of 30,000 square feet. The following divisions were made of the work: motor designing and testing; aeroplane designing; aeroplane development; research and test. This last named division is elaborately organized into 10 subdivisions with full facilities, the equipment being stated to be the most complete and highest grade of any aeronautical plant in the world.

As indicating the diversity and condition of the American aeroplane industry in 1916 mention may be made of the bids opened on November 23rd by the U. S. War Department for 148 service twin-motored hydroaeroplanes for coast artillery service. Twelve companies submitted proposals offering both biplane and triplane types at figures ranging on equipped machines from \$14,800 to \$29,497 each.

The official specifications required the machines to be able to rise from rough water and to ascend within 1000 feet from the starting point, with a minimum speed of 45 miles an

hour, and able to carry a weight of about 450 pounds. The companies bidding were:

Curtiss Aéroplane Company, \$22,500 each for as many machines as desired; Wright-Martin Aircraft Corporation, \$29,497 each for 12 machines and \$25,800 each for 148; Buffalo Aéroplane Company, \$14,520 each for 80; the Aéro Marine Engineering and Sales Company, \$18,000 each for 16; Albert H. Heinrich, \$12,875 each for 16; the Gallaudet Company, \$25,920 each for 32; the L. W. F. Engineering Company, \$19,000 each for 32; Benoist Aéroplane Company, \$12,000 each for 148; the Burgess Company, \$11,000 each for 24; the Standard Aéro Corporation, \$20,000 each for 148; the Cohen Motor Company, \$23,150 each for 80, and the New York Aéroplane Construction Company, \$20,000 each for 148.

The statistics of the Department of Commerce, covering the 10 months of 1916 ended with October, indicated that aéroplane exports from the United States for the year 1916 had been about \$100,000 below the shipments in 1915.

In the 10 months ended with October the value of aéroplane shipments amounted to \$3,517,399, as compared with \$3,631,546 for the same period in 1915. In the ten months of 1914 the shipments had a value of only \$214,057. It was estimated at the end of the year that the total exports of heavier-than-air machines in the entire twelve months of 1916 would approximate \$4,317,399.

England was the best customer of American aéroplane manufacturers, and it was thought that the falling off in exports in 1916 was due to the more adequate facilities of the English factories to turn out sufficient supplies. Russia, Italy, Portugal, and presumably France, of the Entente Allies, also were liberal buyers in 1916 of American flying machines.

An American improvement in aéroplane construction was the vanadium-steel aéroplane, as shown in the Sturtevant battle 'plane, designed by G. C. Loening, where all the parts were standardized and made absolutely interchangeable. This use of steel affords greater strength and generally increases the efficiency of the machines. The steel tubing was stronger than a wooden structure of the same weight, while for the fuselage a special construction of steel angles, channels, and special sections was contrived. This gave a fuselage weighing but 165 pounds as compared with 200 pounds for a wooden structure of corresponding size and strength. The engine beds were also made of steel and the development of rudders, wing flaps, and wing structure entirely of steel was in progress, the steel wings having passed successfully the severe tests to which they were submitted.

Towards the close of the year it was announced that in the proposed Polar expeditions of Capt. Robert A. Bartlett and Capt. Roald Amundsen aéroplanes and aviators would be used extensively. It was proposed not only to use the aéroplanes for scientific observations and reconnaissance but to communicate between the two ships, or in the event of the crushing of a ship or other mishap to provide assistance. One aéroplane was presented to Captain Amundsen and in the interval before the departure of the expeditions it was hoped to provide a complete aéroplane equipment, including machines with a radius of 1000 miles.

CARLSTROM'S CHICAGO TO NEW YORK FLIGHT. A noteworthy flight was started at dawn on November 2nd when Victor Carlstrom, in the Curtiss 200 horse power biplane "The New York Times," left Chicago on a trip to New York. On this flight he succeeded in breaking the American cross-country non-stop record by flying 452 miles from Chicago to Erie, Pa., and then the American speed record for cross-country flight by making the 315 miles from Hammondsport to Governor's Island, New York Harbor, at the rate of 134 miles an hour. Over 1000 pieces of mail were carried, and the success of direct aerial communication between the two cities which had been discussed since 1910 was established. The flight, begun at 6.09½ in the morning, was halted at 11.27 at Erie, to repair a slight leak in the gasoline feed pipe, but at 2.35 Carlstrom was in the air again and headed due east, landing at Hammondsport, N. Y., at 4.24. On the following morning at 6.35 Carlstrom started on his last leg, and made the 315 miles to Governor's Island in 2 hours and 21 minutes, arriving there at 8.56.

Carlstrom, earlier in the year, on August 25th, at Newport News, with a passenger, had flown the Curtiss twin-motor military biplane 641 miles in eight hours and forty minutes, and earlier in the year had flown a machine of the same type from Newport News to Sheepshead Bay. On May 24th he had flown with a passenger from Sheepshead Bay to Washington, a distance of 237 miles, in 187 minutes.

FLIGHT OF MISS RUTH LAW. On Nov. 19, 1916, Miss Ruth Law flew from Chicago, Ill., to Hornell, New York, a certified distance of 512.123 miles, thus establishing an American cross-country distance record for pilot alone, duly recognized by the Aéro Club of America, and the world's record for women fliers. The only aviator who had flown longer than Miss Law in a cross-country flight was Sub-Lieut. A. Marchal of the French army, who, on June 20th and 21st had flown in a Nieuport monoplane from Nancy, France, to Chelm, Poland, a distance of 812.5 miles, in the course of which he dropped proclamations on Berlin.

Miss Law's flying record was as follows:

Left Chicago (Eastern time) .....	8:25:00 A. M.
Arrived Hornell, N. Y. ....	2:10:00 P. M.
Left Hornell .....	8:24:00 P. M.
Arrived Binghamton, N. Y. ....	4:20:00 P. M.
Left Binghamton .....	7:28:00 A. M.
Arrived New York .....	9:37:35 A. M.

	Time	Miles
Chicago to Hornell .....	5:45:00	590
Hornell to Binghamton .....	0:56:00	90
Binghamton to New York .....	2:14:35	204
<b>Total .....</b>	<b>8:55:35</b>	<b>884</b>

An interesting feature of Miss Law's flight was that it was accomplished in a small machine, in fact about one-half in width and height that used by Carlstrom, and she had limited gasoline capacity. Furthermore, a point most favorably commented on was that the trip had been made in an almost obsolete type of American aéroplane with a common stock motor. Miss Law received many congratulations and honors on her success, including a testimonial of \$2500 from the Aéro Club of America and a large banquet tendered by the Civic Forum of New York City.

OTHER NOTABLE EVENTS. While in no way



comparable to the European bombing expeditions or reconnaissances in force, in which 60 or more aeroplanes would participate at times on the Western Front, one of the important events of the year in America on account of the number of aeroplanes participating was the flight of a squadron of 12 aeroplanes from the government aviation field at Mineola, Long Island, to Princeton, N. J., arriving in time to witness the Princeton-Yale football game. The flight was made by United States army and other aviators.

The first machine to take the air was driven by First Lieut. W. G. Kilner, United States army, in command of the squadron, and he was followed by Capt. Raynal C. Bolling, N. G. N. Y., and Capt. Ralph L. Taylor, Connecticut N. G. Then at one minute intervals the other eight machines took the air. These were piloted by Sergt. D. R. Noyes, Lieut. James E. Miller, Sergt. W. P. Willets, Lieut. Alexander B. Thaw, A. S. Adams, Sergt. J. H. Stevenson, and H. R. Blakely.

The 10 aeroplanes when over Governor's Island, New York Harbor, were joined by two others, one carrying Baker of Princeton and Cord Meyer of Yale as passenger, and the other piloted by Philip A. Carroll. The trip was made in flight formation and was the first in which so many aeroplanes had flown together across country in the United States. Two met with trouble and were forced to land, but effected repairs speedily and all arrived safely at Princeton. The return flight to Mineola was equally successful notwithstanding a heavy mist.

Another notable event in American aviation was the flight of eight aeroplanes from Hempstead Plains to Philadelphia on December 30th. Twelve machines, piloted by United States army officers, members of the Aero Club of America, or professional aviators, started in the cold at 10 o'clock in the morning, and eight machines were able to negotiate the distance of 115 miles in less than two hours. The fastest time was made by Lieut. A. M. Coyle, New Hampshire National Guard, and was 97 minutes. The eight machines that completed the full distance descended in the following order at the Philadelphia Navy Yard: Lieut. A. M. Coyle of the New Hampshire National Guard, with a passenger, 11.34 A.M.; H. W. Brickley, with C. H. Reynolds, passenger, 11.40 A.M.; Tex C. Millman, with S. A. Blair, 11.45 A.M.; Capt. J. E. Carberry, Army Signal Corps, 11.50 A.M.; Lieut. James E. Miller, New York, 11.52 A.M.; Lieut. G. Osborne, 11.53 A.M.; Leonard Barney, with Instructor Allen, 11.56 A.M.; Lieut. E. W. Bagnall, with Sergt. E. A. Krauss, 1.30 P.M. Motor troubles and minor mishaps caused the descent of four of the entrants and the extreme cold experienced caused considerable hardship. On this flight a number of new devices, including stabilizers and especially a new drift indicator were tested. The machines used were bi-planes, Curtiss military tractors, with 90 horse power motors, and carried 25 to 30 gallons of gasoline.

On the return trip on the following day a new record of 72 minutes for the 115 miles was made by H. W. Blakely, or an average speed of a mile in 38 seconds for the entire distance. Captain Carberry arrived second at Hempstead Plains with the same time and Sergeant Salmon arrived one minute later. Flight-instructor Bonney required 78 minutes in

a 135 horse power L. W. F. machine, while Lieutenant Miller made the journey in 86 minutes. Two of the seven aeroplanes starting on the return trip were forced to descend en route.

On April 30, 1916, a Curtiss Model JN machine with pilot and passenger climbed 16,500 feet in 1 hour and 30 minutes. A five passenger hydroaeroplane flew from Newport News to Baltimore on April 6th in 3 hours and 3 minutes. As already mentioned, a flight from Newport News to New York was made on May 28th, by Carlstrom in a Curtiss aeroplane with two 90 horse power motors with a load of 800 pounds in 4 hours and 1 minute.

On April 26th at Brooklands, England, H. G. Hawker attained a height of 24,408 feet in an aeroplane, thus making what was accepted by the Royal Aero Club as a world's record, since a flight of 25,756 altitude made by a German aviator, Heinrich Hoelerich, in 1914, never was recognized by that body.

PROPOSED AERIAL POST. The success of the flights of Carlstrom and Miss Law gave increased impetus to the efforts to establish aerial post routes, and on December 14th it was announced that there was tentatively under consideration in connection with the proposed appropriation of \$100,000 for experimental aerial mail service by the government, a plan for regular aerial mails between New York and Chicago. It was estimated that the trips could be made in from 6 to 14 hours, depending upon the wind, and that the average time for the 720 miles air line distance would be eight hours, mails being carried between sunrise and sunset. Each plane would carry from 500 to 1000 pounds of mail matter and commercial interests proposed to take up the establishment of such a service.

One plan outlined in the aeronautical magazine *Flying* involved emergency stations every 22 miles, each equipped with powerful search lights, two landing stations, and one relay station. "The planes would leave the two termini at 6 P.M. and deliver the mail before 9 A.M. the following day. Under the most favorable conditions, the mail would reach destination by midnight. From 500 to 1000 pounds of load or 'cargo' would be carried. Leaving New York at dusk, the air mail carrier would follow the lights at the emergency stations to the first landing station, which would be in the vicinity of Williamsport, Pa. There, at a flying field fully equipped with hangars, tools, and spare parts, he would stop for oil and gas, and would then continue to the relay station near Niles, Ohio. Here another machine would finish the flight, landing once at the second landing, near Napoleon, Ohio. One extra machine with a pilot would be maintained at each landing station and three extra machines and pilots at the relay station."

A practical demonstration of the value of an aerial mail service was afforded by the communication maintained by General Pershing's expeditionary force at Colonia Dublan, Mexico, and the United States army base at Columbus, N. M. The distance is 120 miles and an average of 66 minutes was the flying time for an aviator from the First Aero Squadron who was accustomed to transport from 250 to 300 pounds of mail.

In connection with aerial post routes it was believed that the end of the European war would

release a large number of skilled aviators who could be used commercially with corresponding advantage. While this had not been agitated in Europe to any great degree, yet it was realized.

In the United States it was thought that in addition to the 12 hour one-, two-, or three-stop aeroplane mail service between New York and Chicago, already mentioned, a two-hour non-stop flight between New York and Boston, a three-hour non-stop service between Chicago and St. Louis, and even a 36-hour six-stop service between New York and San Francisco, were possible of early commercial realization.

A noteworthy instance of the practical use of aeroplanes was the relief of the starving British garrison of Kut-el-Amara by dropping 18,800 pounds of food as well as mail and stores from April 11th to 29th.

**DIRIGIBLES.** A novelty in aeronautics for 1916 was the construction in England of combination dirigible-aeroplane machines which received the name of "Blimps." These were really miniature airships, but were found most serviceable for scout and patrol duty over the waters of the British Isles. In connection with these and other dirigibles the British developed improved forms of gas generators of increased portability. Aside from the military activity of the Zeppelins the few reports available seemed to indicate improved construction of these leviathans of the air and the L33 brought to the ground in England on September 23rd was carefully studied by British designers and air pilots in as much as it represented the most advanced practice. As a naval scout it was considered to represent the highest mark of progress, while as an aerial transport or passenger ship it had possibilities far beyond any of its pre-war predecessors. It had sufficient power for a non-stop flight of at least 1500 miles at 60 miles an hour, or better with a favoring wind, and it certainly represented some 30 per cent increase in speed over the airships of 1914. Indeed from a study of this airship British experts believed that the problem of a non-stop transatlantic flight had been solved and that a few improvements easily obtainable would make possible a 3066-mile trip from Liverpool to New York.

**AEROSTATS.** The National Balloon Race for aerostats or non-dirigible gas-filled balloons, took place on Oct. 7, 1916, from Muskogee, Okla., with six entrants, all of whom started. The gas used for inflating the balloon was good natural gas, lifting about 30 pounds to the 1000 feet. First prize was won by H. E. Honeywell, piloting the balloon *Uncle Sam*, representing the Kansas City Aero Club, with his aide, Jack Horne, covering a distance of 520 miles.

The other five entrants won places as follows: Second, E. S. Coles; third, John Berry; fourth, William F. Assman; fifth, Warren Rasor; sixth, Dr. L. E. Custer.

During the year the American Society of Aeronautic Engineers consolidated with the Society of Automobile Engineers, forming a new organization known as the Society of Automobile Engineers. The problems involved in light weight and high efficiency internal combustion engines of so many types are so closely related that it was believed that a single organization would prove more effective. See also **OCCUPATIONAL DISEASES.**

**AEROPLANE.** See **AERONAUTICS.**

**AEROSTAT.** See **AERONAUTICS.**

**AFGHANISTAN.** A Mohammedan monarchy of central Asia. The capital is Kabul. The area of the country is estimated at about 225,000 square miles. The inhabitants are supposed to number about 5,000,000. The population of Kabul is estimated at 180,000; Kandahar, 40,000 (some estimates are higher, one being 80,000); Herat, 20,000. The Afghans, many of whom are turbulent tribesmen, engage in grazing and agriculture. Foreign trade is carried on principally with British India and Bokhara. Exports include cereals, lentils, fruits, live animals, wool, hides, ghi, silks, felts, carpets, and camels'-hair goods. Leading imports are cotton goods, tobacco, dyeing materials, sugar, and tea. According to British Indian statistics, exports of merchandise from British India to Afghanistan in the year 1913-14 were valued at £1,013,000, and imports of merchandise from Afghanistan to British India at £860,000; in 1914-15, £907,000 and £807,000. Imports from Bokhara to Afghanistan are supposed to amount to about 4,000,000 rubles, and exports the same. An indeterminable revenue is derived mainly from taxation on production, and its collection is attended with oppression and extortion. The loosely organized government is headed by an ameer, whose annual revenues probably exceed 13,000,000 rupees; from the Government of India he receives an annual subsidy of 1,800,000 rupees. The ameer in 1916 was Habib Ullah Khan; he was born in 1872 and succeeded his father, the famous Abd-ur-Rahman Khan, in 1901. The country is in the sphere of British influence, having by treaty no foreign relations except with the Government of India. In the Anglo-Russian agreement of Aug. 31, 1907, Russia recognized Afghanistan as being outside of Russian influence.

**AFRICA.** See articles on the various African countries; also **ANTHROPOLOGY; ARCHÆOLOGY; EXPLORATION; PEABODY MUSEUM.**

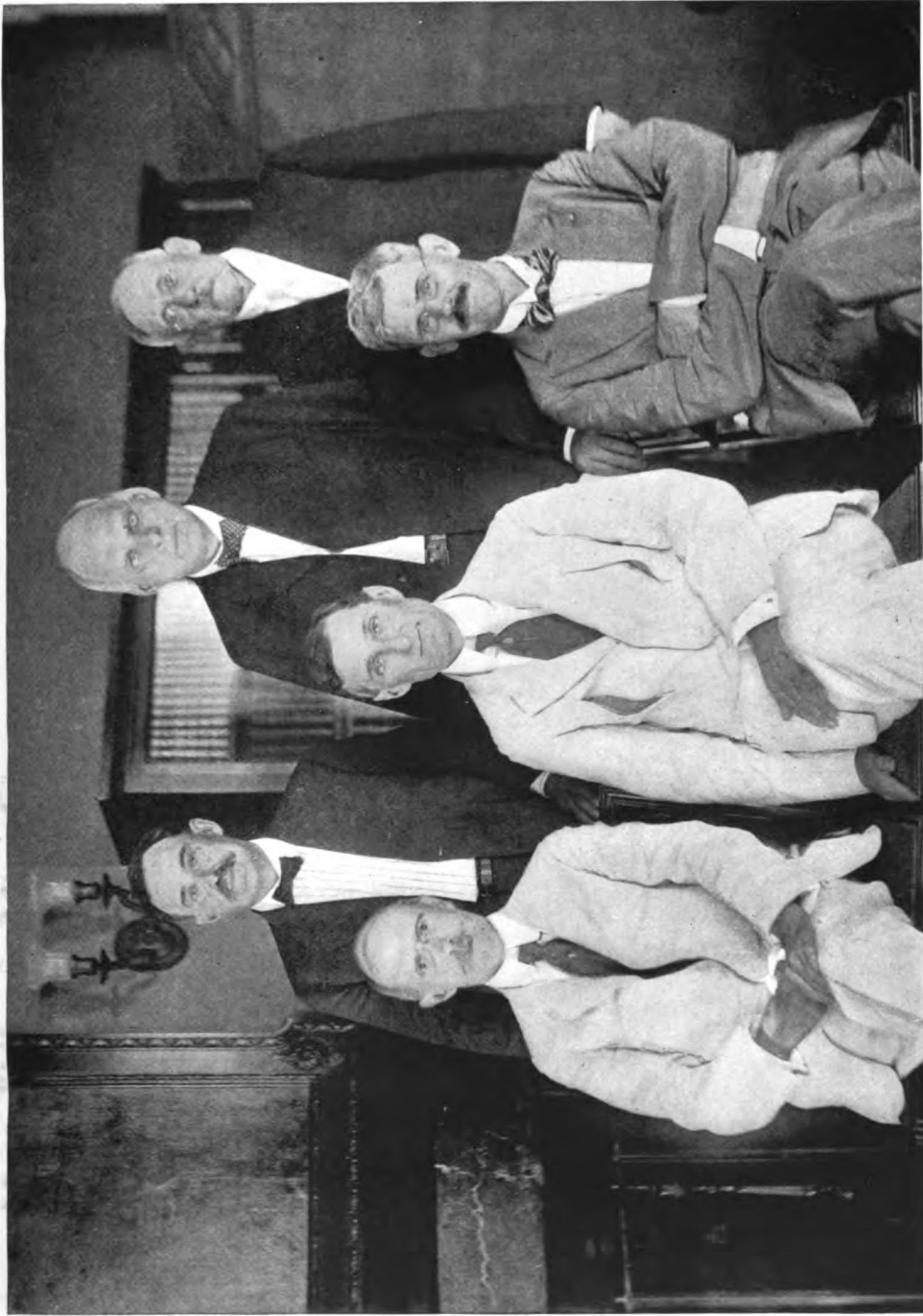
**AFRICAN METHODIST EPISCOPAL CHURCH.** See **METHODISTS, COLORED.**

**AGRICULTURAL BANKS.** See **AGRICULTURAL CREDIT.**

**AGRICULTURAL COLLEGES.** See **AGRICULTURAL EDUCATION.**

**AGRICULTURAL CREDIT.** For several years there has been carried on in the United States a widespread agitation, particularly among farmers, in favor of the establishment of some form of agricultural credit. In 1913 an American Commission of nearly 100 members made a study of farm credit methods in various European countries. Thereafter much publicity was given to the plans of the Raiffeissen and the Landschaft systems in Germany, as well as co-operative farm credit unions in Italy and elsewhere. Bills were introduced in Congress each year, but failed of acceptance because of differences in the proposals of the two Houses. Finally late in December, 1915, a sub-committee of a Joint Congressional Committee on Rural Credits completed the draft of a bill which was finally signed by the President on July 17, 1916. The fundamental principle of this act is the utilization of land values as the basis of mortgages which shall in turn constitute the security behind bonds, these bonds being sold to general investors as the source of new capital for additional mortgage loans.

The act creates a Federal Farm Loan Board



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Left to right, seated: George W. Norris, Secretary of Treasury W. G. McAdoo, W. S. A. Smith. Standing: Charles E. Lobdell, Herbert Quick, and W. W. Flinnagen, Secretary of the Board

THE FEDERAL FARM LOAN BOARD



of five members to have direct control of a system of national land banks which are empowered to make long time loans on an amortization plan and secured by farm land mortgages. This board will control a bureau of the United States Treasury Department. The Secretary of the Treasury is ex-officio chairman of this board; and the other four members are appointed by the President and will serve in the first instance for two, four, six, and eight years respectively with an additional term of eight years in each case unless removed for cause by the President. The members of this board are: Charles E. Lobdell, Republican, of Great Bend, Kan.; George W. Norris, Democrat, of Philadelphia; W. S. A. Smith, Republican, of Sioux City, Iowa; and Herbert Quick, Democrat, of Berkeley Springs, W. Va. They will receive \$10,000 per year and necessary traveling expenses. They may not during their term of office be connected with any banking or land mortgage business. They shall appoint a farm loan registrar in each land bank district, and bank appraisers, examiners, and other necessary administrative officers.

The law required this board to divide the United States into 12 federal land bank districts and to establish in each a federal land bank. Each such bank may establish branches within its district. On November 27th the board returned to Washington, having completed an extensive investigation regarding the proper location of these districts and banks. On December 27th it announced that the twelve districts would be made up as follows: 1. Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, and New Jersey, with bank at Springfield, Mass.; 2. Pennsylvania, Delaware, Maryland, Virginia, West Virginia, and the District of Columbia, with bank at Baltimore, Md.; 3. North Carolina, South Carolina, Georgia, and Florida, with bank at Columbia, S. C.; 4. Ohio, Indiana, Kentucky, and Tennessee, with bank at Louisville, Ky.; 5. Alabama, Mississippi, and Louisiana, with bank at New Orleans, La.; 6. Illinois, Missouri, and Arkansas, with bank at St. Louis, Mo.; 7. Michigan, Wisconsin, Minnesota, and North Dakota, with bank at St. Paul, Minn.; 8. Iowa, Nebraska, South Dakota, and Wyoming, with bank at Omaha, Neb.; 9. Oklahoma, Kansas, Colorado, and New Mexico, with bank at Wichita, Kan.; 10. Texas, with bank at Houston; 11. California, Nevada, Utah, and Arizona, with bank at Berkeley, Cal.; 12. Washington, Oregon, Montana, and Idaho, with bank at Spokane, Wash. At the same time it was stated that applications for loans aggregating \$150,000,000 had already been received from 50,000 farmers.

**FARM LOAN BANKS.** The capital stock of each bank at the start must not be less than \$750,000 in shares of \$5 each. This stock may be purchased by individuals, firms, corporations, and the United States and State governments. All stock not subscribed for within thirty days after subscription books are opened will be purchased by the United States. Thereafter only farm loan associations borrowing from the banks or the United States government may subscribe for stock. The government holdings do not participate in dividends, all other shareholders participate equally in dividends. After farm loan association subscriptions (see below)

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amount to \$750,000 in any land bank the original capital stock shall be gradually retired. In this manner it is expected that after a time only borrowers and farm loan associations will be stockholders. These federal land banks are empowered to purchase first lien farm mortgages from federal farm loan associations and approved agents and to issue, sell, and repurchase guaranteed farm loan bonds secured by said mortgages. They are given all additional powers necessary to carry out these fundamental purposes, such as disposing of land acquired in satisfaction of debts, the deposit of securities and funds with Federal Reserve banks, the borrowing of money, and buying and selling United States bonds. On the other hand such banks cannot accept demand deposits except from their own stockholders; they cannot make mortgage loans except through agents or farm loan associations; they cannot accept anything but first mortgages and their outstanding bonds may not exceed twenty times their capital and surplus. Mortgages thus utilized must be secured by productive farm land within the same Federal district; they must not exceed 50 per cent of the appraised value of the land plus 20 per cent of the insurable value of the permanent improvements. These mortgages will be for terms of from 5 to 40 years, and payable in annual or semi-annual sums such that the principal is gradually extinguished. However, after five years the periodic payments may be increased or the entire mortgage canceled by one payment. The interest rate on mortgages may not exceed 6 per cent; and neither local associations nor a Federal bank may charge a commission. In other words, profits must come from the difference in the rate of interest of the mortgages and the bonds based thereon. But the borrower may be required to pay a fee for appraisal and searching of title. Mortgages acceptable to the land bank must be issued for one of the following purposes: to purchase land for agricultural uses; to purchase equipment, fertilizers or live stock; to provide buildings or other improvements; or to discharge indebtedness incurred for like purposes. Moreover, before a borrower may legally join a local association he must already be or contemplate becoming in the near future an actual cultivator of the soil. Single loans are limited to sums ranging from \$100 to \$10,000.

The bonds issued by the Federal land banks and based on an equal amount of the above mentioned mortgages or United States government bonds will be in denominations of \$25, \$100, \$500, and \$1000 and will bear interest not exceeding 5 per cent. These bonds are guaranteed by all Federal land banks; and they are designated "instrumentalities of the government of the United States" so as to exempt them from taxation by local civil authorities. A similar exemption applies to the stock of the banks and mortgages held by them.

**NATIONAL FARM LOAN ASSOCIATIONS** may be formed by ten or more persons already engaged or soon to engage in farming and desiring loans aggregating at least \$20,000. Such associations will be incorporated under federal control. Their shares of \$5 each will carry a double liability. Such stock may be owned only by borrowers who must subscribe 5 per cent of their loan to the capital

stock of the local association. The local association in turn must subscribe for an equal amount of federal land bank stock. The shares of local associations are subject to assessments for operating expenses when necessary. The applications of local associations will be forwarded to a land bank which will investigate the applicants and their lands. If favorable the bank will then recommend to the Federal Farm Loan Board at Washington the issuance of a charter to such association. After being thus chartered the local association can sell loans to its district land bank. It may admit to membership other land owners who seek loans, subscribe for the required proportion of the stock, and are otherwise acceptable. The local association guarantees to the federal bank the payment of principal and interest on loans and the payment of taxes. The local association may charge a commission for interest collection not to exceed one-eighth of 1 per cent semi-annually on the aggregate of loans. The local association really originates an application for a loan; the making of the loan is the work of the federal land bank which will actually complete a loan only after investigation by a government appraiser.

**AGENTS.** Where no local association is formed within one year after the establishment of the federal land banks such banks may appoint as its agent in such locality an incorporated bank, trust company, mortgage company, or savings institution, subject to the approval of the Federal Board. Such agent may negotiate loans on the same basis as the local associations above described except that the borrower now subscribes directly 5 per cent of his loan for federal land bank stock. Such agents may charge a commission of not more than one-half of 1 per cent per annum on loans outstanding, but such commissions must be paid from dividends declared on the borrower's stock in the federal land bank. The borrower must meet the expenses of appraisal and title examination. A very important provision regarding agents is that which requires them to guarantee the payment of principal and interest. Many States prohibit banks giving such guarantees and doubtless many not thus prohibited will hesitate to assume the responsibility.

**JOINT STOCK BANKS.** The act also permits the establishment of private corporations to be known as joint stock land banks, formed by ten or more persons for the purpose of making farm loans. These must have at least \$250,000 fully paid up capital before issuing any bonds. Their stock will carry a double liability. They may issue bonds up to 15 times their capital stock and surplus. The United States may not be a stockholder. Such banks may make loans in excess of \$10,000 and the purposes for which such loans are made are unrestricted. Interest charges, however, may not exceed 6 per cent; no commissions may be charged; and the plan of amortization applies to repayment of loans.

**AMORTIZATION PLAN.** By this plan of payment is meant the gradual reduction of a loan by annual or semi-annual payments which cover not only interest but a portion of the principal. Thus a loan of \$1000 at 5 per cent for 20 years would be extinguished by 20 annual payments of \$80.24. The interest the first year would be

\$50 and the amount of the principal canceled \$30.24. Thereafter each year the interest would diminish and the amount applicable to principal would increase. A debt of \$1000 bearing 5 per cent interest would be similarly canceled by forty annual payments of \$50.52.

**CALIFORNIA.** A cooperative inquiry was begun in California and continued throughout the summer and fall into the question of land settlement and rural credits. This investigation was carried out by the State Rural Credits and Land Colonization Commission, the University of California, and the Commonwealth Club. It was due in part to the extensive interest in mortgage loans to farmers and in part to a desire to increase the utilization of vacant land which has been increasing rapidly in value. The above Commission was required to report its recommendations to the State Legislature in 1917.

See CREDIT UNIONS.

**BIBLIOGRAPHY.** The following references include the more important publications on this subject in 1916: Guaranty Trust Company of New York, *Digest of the Federal Farm Loan Act*; M. T. Herrick and R. Ingalls, *How to Finance the Farmer*; R. Metcalf and C. G. Black, *Rural Credit Co-operation and Agricultural Organization in Europe*; H. Myrick, *Federal Farm Loan System*; K. W. Robins, *Farm Mortgage Handbook*; H. Wolf, *Co-operative Credit for the United States*; and the *Annual Report of the Jewish Agricultural and Industrial Aid Society*, 174 2nd Ave., N. Y. City.

**AGRICULTURAL EDUCATION.** In the United States the State colleges of agriculture continued during the year the steady growth of the past ten years, during which time their enrollment of regular four-year college students in agricultural courses has been increasing at a rate varying from 12 to 20 per cent each year. Unusual interest in administrative problems has been evident, due in part to the growth of the regular teaching division and to the difficulties in adjustment to enlarged functions resulting from an exceedingly rapid development in agricultural extension teaching. The principal adjustments being made are those concerning the relations of the three divisions, research, teaching, and extension, to the chief administrative officer, and the interrelationships between the three divisions.

Extensive studies of problems relating to the administrative questions before the agricultural colleges are being made by the Committee on College Organization and Policy of the Association of American Agricultural Colleges and Experiment Stations. During the past year two studies have been completed: One on the composition, manner of selection, terms of office, and functions of the boards of control of the institutions; the other on the organization as affected by the development of extension-teaching divisions. This latter is to be published by the Committee.

Among the noteworthy reorganization in general control during the year was that in Maryland. The State Legislature early in 1916 granted a new charter to the institution, which in the past was owned in part by private interests. These interests were purchased by the State, so that the college is now entirely under State control. A new board of trustees was formed, and the institution was given largely

increased State appropriations. At the same time that the Legislature provided for this reorganization, it provided also for uniting several State boards having to do with agriculture into one central board. The new board of trustees of the college has been named as this central board, so that it has not only the supervision of the college and its activities, but also the general agricultural control work frequently under the supervision of other State boards of agriculture.

The rapid growth of the agricultural colleges, with the increasing sphere of influence due in some measure to the extension teaching, has forced into prominence the question of the relationship of these institutions to other State educational institutions, especially to the State universities in several States where the two are now separate institutions, resulting in duplication and competition for appropriations. During the year three States, Iowa, Washington, and North Dakota, attempted to find a solution by having surveys made of their institutions and their work by the United States Bureau of Education. The Bureau's investigations were completed and reports have been printed and distributed.

One of the proposals made by the Bureau as a means of settling the difficulties arising from duplication, is the adoption of the principle of "major and service lines of work." In accordance with this principle each State institution would have assigned to it certain major fields which it might be expected to develop to their fullest extent. Service lines are such subordinate subjects as are essential to the proper cultivation of a major line. Agriculture at the State colleges of agriculture is, of course, a major line. Languages, history, and political science are major lines in a State university. English is a service line in the agricultural colleges and may be a major line in the university.

The Graduate School of Agriculture, under the auspices of the Association of American Agricultural Colleges and Experiment Stations, was held at the Massachusetts Agricultural College, Amherst, Mass., during July. This was the seventh session of the school. Dr. A. C. True, Director of the States Relations Service of the United States Department of Agriculture, again served as dean. The three principal topics taken up during the four-weeks' session were (1) factors of growth of plant and animal life; (2) agricultural economics and rural sociology; and (3) fundamental problems of intensive agriculture. The attendance, made up principally of members of the teaching, research, and extension staffs of the agricultural colleges, indicated that special needs are being met by this graduate school and that there will be a place for it in the American educational system for some time to come.

The rapid growth of the colleges in enrollment has forced unusual activity in building operations. During the year Arizona completed an agricultural building costing \$165,000; Alabama, a hog-colony serum plant costing \$25,000; Colorado erected a central meeting station costing \$85,000; Delaware had under way a new agricultural building to cost \$300,000; Georgia provided a building for agricultural engineering costing \$25,000; Illinois expended \$360,000 on a chemical laboratory and \$120,000 on a ceramic building; Purdue University of

Indiana built a new veterinary building at an expenditure of \$50,000; Oregon had under construction a \$40,000 forestry building; South Dakota had under construction a dormitory which would cost \$75,000; and West Virginia started work on a \$100,000 agricultural building and recently purchased 600 acres for instruction and experimental purposes.

**AGRICULTURE IN HIGH SCHOOLS.** Statistical information collected during the year shows that approximately 2500 public high schools in the United States, or nearly one-fifth of the total number, were teaching agriculture. About one-third of the courses given in these schools were primarily vocational in purpose; the others were for general information. One-half of the schools teaching vocational agriculture were following the home-project method; that is, each student carried on at home under the direction of the school a complete farming project, such as raising a particular crop, including all operations from the selection of the seed to the disposal of the harvest, or the full care of two, three, or four dairy cows of the home herd for a twelve-months' period, etc. The schools teaching through the home-project plan are most numerous in the Northeastern States and in Louisiana. In them trained teachers are employed for twelve months in the year, devoting their summer months to the supervision of the home work of their pupils.

One-half of the 2500 schools teaching agriculture gave no practical work, confining themselves entirely to classroom and laboratory instruction with occasional visits to neighboring farms. The instruction was given by nearly 2700 persons, 10 per cent of whom were women. About one-third of the 2700 teachers had had special training in agriculture in institutions of college grade; only one-eighth had had the equivalent of a full four-year course in a State agricultural college.

The number of pupils studying agriculture during the past year in these 2500 schools was approximately 45,000, of whom 14,000 were girls. The courses varied from a few weeks in length to a full four years. In many of the home-project schools one-half of the entire time of the pupil was devoted to agriculture, including the time spent in classroom, laboratory, and in the performance of the home-project itself.

College entrance credit is now given for high school agriculture by 44 of the State colleges of agriculture and mechanic arts or the institutions of which they are a part. The amount of credit is from one-half to four units, and is given for admission not only to the agricultural colleges but to all departments of the institutions.

**SPECIAL AGRICULTURAL SCHOOLS.** The number of special agricultural schools below college grade maintained in the United States during the past year was approximately 75. This includes only institutions supported in whole or in part by the States. They received during the year about \$800,000 of public money from State and county treasuries and other sources. They had 6500 pupils in agricultural work and approximately 450 teachers. Practically all the agriculture in these schools was taught by graduates of State colleges of agriculture.

These 75 schools do not include the secondary agricultural schools maintained by ten of

the State agricultural colleges, nor the one- and two-year agricultural courses below college grade given by twenty others.

An interesting new special agricultural school was opened during the year at Farmingdale, Long Island, by the State of New York. It is teaching practical farming and gardening to city boys. Farm boys are not excluded, but the instruction and practical work is arranged for boys without farm experience and not familiar with ordinary farm operations. Nearly its entire enrollment is made up of such boys, mostly from New York City.

The permanency of the interest in agricultural education is evidenced by the amount of time given to its discussion at educational meetings during the year. It continues to have a very prominent place on the programme of the National Education Association, the Department of Superintendence, and the American Association for the Advancement of Science. An unusual meeting of international importance was the Pan-American Scientific Congress, held at the close of 1915 and beginning of 1916. Its section on education devoted a relatively large part of its time to agricultural education. It was evident that the question is important in the other American countries as well as in the United States, by the great amount of interest manifested by the delegates from these countries who were very eager in their search for information.

**AGRICULTURAL EDUCATION IN EUROPE.** The Secretary of the British Board of Agriculture and Fisheries stated during the year to the House of Commons that while the British scheme of agricultural education had been retarded by the war, the popularity of agricultural education had undoubtedly increased and that there had been real progress in the use made by farmers of the facilities offered. He expressed the belief that no previous expenditure had helped in the present war more than that for agricultural education.

Very many of its agricultural colleges have felt the effects of the war. The Royal Agriculture College at Cirencester and the Agricultural and Horticultural College at Uckfield have been closed, and Armstrong College has been taken over as a military hospital, its agricultural department being temporarily housed in a dwelling.

Many of the French schools of agriculture had to close their doors on the outbreak of the war, but arrangements have since been made to open a part of them. The national schools of agriculture at Rennes and Montpellier are being occupied by the sanitary service. A considerable number of the practical schools of agriculture and the farm schools have resumed operation, and several of these are receiving soldiers injured in the war.

In Austria twelve farm schools, thirty-five winter schools, and seven elementary forestry schools were temporarily closed on account of the war. Several minor institutions in Germany closed their doors temporarily, and the courses and attendance at the larger colleges were much affected.

**AGRICULTURAL EXPERIMENT STATIONS.** The organization of agricultural extension work in the United States on a nationwide scale is having a noticeable effect on the experiment stations, in emphasizing the impor-

tance of their work as the substantial basis for teaching, and in allowing them to confine themselves more generally to experiment and research. It has therefore given the stations an enlarged opportunity and their work an additional significance.

The revenues of the American stations the past year aggregated something over \$5,000,000, approximately \$2,000,000 of which was derived from direct appropriations by the States. The personnel of their staffs included nearly 1900 persons.

A monument to the memory of Hon. William H. Hatch, through whose instrumentality the Federal act establishing the American system of experiment stations was provided, was erected at Hannibal, Missouri, his former home, and dedicated during the fall of 1915.

Dr. Joseph H. Kastle, director of the Kentucky Experiment Station, and an investigator of wide reputation, especially in the field of biological chemistry, died Sept. 24, 1916.

An addition to the group of agricultural buildings at the California University and Station, to be known as Hilgard Hall, has been planned and authorized, with an appropriation of \$350,000. A set of buildings for the Citrus Sub-station, at Riverside, California, on its new permanent site, are under way at a cost of \$125,000. A new building for the work in genetics at the Illinois Experiment Station, and a new barn for the use of the department of experimental breeding at the Wisconsin Station, have been provided. In New York, a \$100,000 building for administration, library, and auditorium has been provided for the State Station at Geneva. Active work has begun on the new sub-station in Arizona, situated in the Salt River Valley and consisting of a tract of 160 acres. This farm will be devoted to experiments in horticulture, agronomy, and animal husbandry, and the experimental work in irrigation will be mainly conducted there.

A tract of land in the Matanuska Valley of Alaska, through which the new government railroad is being built, has been set aside by presidential proclamation for an agricultural experiment station, in addition to the four stations already in operation. This and adjoining valleys contain approximately 1,200,000 acres of land which have been shown by survey to be suited to agriculture, and special problems of the region require a station to aid the prospective settlers. Congress has been asked for an appropriation to support the new station.

The Legislature of Massachusetts provided for a market garden sub-station, to be conducted under the direction of the main station at the college but situated in the market gardening region. In the State of Washington an additional sub-station was established at Lind, for experiments in dry land agriculture.

The Nevada Experiment Station has instituted studies in the methods of range improvement on quite an extensive scale, in charge of a newly appointed specialist in range management. This is an important subject in many of the Western States, where the range system prevails extensively and where through improper management the ranges have become greatly diminished in carrying capacity. As these tracts have now come largely into private ownership, improvement is feasible when practical methods can be worked out.



What is practically a privately supported experiment station for animal diseases has been established by the Rockefeller Institute. A tract of 400 acres of land has been purchased near Princeton, New Jersey, and a laboratory, the erection and equipment of which is expected to cost nearly a million dollars, was nearing completion at the close of the year. The investigations are under the direction of Dr. Theobald Smith.

As was natural, the war has had a considerable effect on the experiment stations in Europe. There has been a decrease in the kind of activity which has characterized these stations in normal times. In general their investigation has taken a more severely practical form, and has consisted to a considerable extent of advisory work and the making of tests and trials of various kind growing out of the necessities which the countries have been under. In some countries rules for the practical farmer have been worked out, and elsewhere tests have been made of new materials to serve as substitutes in fertilizing, feeding, spraying, etc., and to replace the necessities of life in time of scarcity and high prices. The war has called many of the workers into the ranks, resulting in a considerable number of deaths, and others have had their activities diverted to aiding the country in maintaining food supply for the people and the soldiers, and to the making of serum, war munitions, etc. In general, the results which the stations have secured in the past have become a source of great strength and resourcefulness, and have been drawn upon to a hitherto unprecedented degree of application.

The appropriation for agriculture in Canada for the year 1916-17 aggregates \$3,258,000, including \$846,000 for the experimental farms and approximately \$1,700,000 for investigation, control functions, and other activities for the benefit of the industry.

An agricultural station has been established at Bie on the Benguela plateau in Angola. Experiments in cotton-growing are among its lines of work.

A new experiment station has been opened in Burma, to be devoted to wheat and other crops of the southern Shan States.

In Denmark a new horticultural station has been established at Blangsted pr. Odense, and the one at Esbjerg has been enlarged and taken over by the state as a branch station. A third station is to be established in Northern Jutland.

A tract of state land in Honduras, about five miles from Tegucigalpa, is being developed for experimental purposes, and it is hoped eventually to maintain a complete experiment station and agricultural school.

**AGRICULTURAL EXTENSION WORK.** Coöperative extension work in agriculture and home economics as provided for in the Smith-Lever Act of May 8, 1914, and other Federal and State legislation, was carried on in 1916 in all the States. This work involved the coöperation of the United States Department of Agriculture, the State agricultural colleges, and a large number of county governments and organizations. In addition, State departments of agriculture and education, county and local school officers and teachers, associations of farmers and of business men aided the extension enterprises. In the United States Department

of Agriculture the States Relations Service has general charge of extension work and through this Service arrangements are made for the extension work carried on by the different bureaus of the Department in coöperation with the State colleges. In each State college this work is managed by a director of extension work, who acts as the joint representative of the college and the Department of Agriculture. In 37 States a separate officer is in charge of the extension work; in 11 States this officer is also director of the experiment station or head of the college of agriculture.

The main features of this coöperative extension system are (1) the county agricultural agents (men), (2) the county home demonstration agents (women), (3) the boys' and girls' clubs, (4) the movable schools of agriculture and home economics, and (5) the supporting work of the college and Department specialists.

The county agents have permanent headquarters within their counties and act as joint representatives of the local community, the State college, and the Department of Agriculture. The salary and expenses of the agents are provided from Smith-Lever funds, State and county appropriations, contributions by associations of farms and others, individual gifts, and funds of the United States Department of Agriculture. The average annual salary of a county agent is from \$1500 to \$2000 and the total annual budget is about \$2500. About three-quarters of the agents are graduates of agricultural colleges. Farm experience is a universal requirement. As a rule the agents are mature men, their average age being over 30 years. While most of the agents maintain offices and have at least one regular office day each week they spend a large share of their time with the farmers in their fields, barns, and homes. They also hold or attend numerous meetings of farmers. The agents conduct field demonstrations with crops, fertilizers, methods of tillage, and in control of plant and animal diseases, and aid in the introduction of better live stock, farm and home sanitation; business methods and marketing; formation of coöperative associations; improvement of country roads, schools, and community interests. They bring in and apply the results of the researches of the experiment stations and Department of Agriculture and disseminate the practical results already attained by successful farmers. They make much use of the local and agricultural press, and of college, station, and Department bulletins. The most successful agents are educators and organizers who influence the farmers by broadening their outlook and getting them to study their own needs and take measures to help themselves.

To support these agents county associations, often called farm bureaus, have been formed. These commonly take the initiative in securing local financial support for the agent, join in his selection and appointment, and aid him in his work. They may also through their own officers engage in various coöperative enterprises. In other cases the agent is aided by community clubs, which may sometimes be federated into a county organization, or by existing granges and other farmers' organizations. Experience has shown that while the sympathy and aid of all classes of people is very desirable, the associations actively supporting the county agents

should be made up chiefly of farmers and be managed by farmers.

The force of men agents in counties organized under this plan increased from about 1100 in 1915 to nearly 1300 in 1916. During the year in the 15 Southern States demonstrations were conducted under the supervision of the county agents by about 110,000 farmers, involving the growing of crops on 1,500,000 acres from which records were obtained, showing on the average an increase of production and profit of 100 per cent over ordinary yields and profits. More than 50,000 head of pure bred or high grade animals were purchased for breeding purposes and over 4600 silos were built. Over 1,700,000 head of live stock were treated for various diseases on advice of the agents. Much attention was given to the feeding of dairy cattle and marketing of the products. The agents made over 600,000 visits to farmers and addressed over 16,000 meetings with an attendance of 1,200,000. Over 1700 community organizations were perfected with a membership of about 45,000. In the Northern and Western States about 108,000 field demonstrations were conducted and over 1,700,000 people were reached through meetings. About 81,000 farmers were enrolled in the farm bureaus. Nearly 80,000 cows were tested for milk production through associations and individuals, and about 8000 pure-bred animals were purchased. Much aid was given farmers in the control of blackleg, anthrax, hog cholera, foot and mouth disease, and other animal diseases. Spraying demonstrations were conducted in a large number of orchards. In the case of oat smut an average increase of nearly 9 bushels resulted from treatment of seed with formaldehyde and this increase was obtained at a cost of less than 10 cents. Farmers' exchanges were organized in connection with many of the farm bureaus. Among other things over 5000 laborers were placed through these exchanges.

The women county agents, often called home demonstration agents, were until recently employed exclusively in the Southern States. On July 1, 1916, there were 466 such agents in the South and 12 in the North. In this work also great attention was paid to community organizations and about 650 such organizations of farm women were formed. These agents gave instruction to over 80,000 women and girls. The work began as a rule with an effort to increase the earnings of the women through the home garden, canning and preserving, marketing of eggs, butter, fruits and vegetables, poultry raising, etc., and the improving of the farm diet. Home sanitation, use of labor-saving devices, combating of insect pests, sewing, care of children, and beautification of the home also received attention.

Demonstration work for negroes has been organized in 11 Southern States with 51 men and 5 women negro agents. Frequently the negro people have made financial contributions to this work. These agents are coöperating closely with the schools for negroes. Through this work thousands of negro land-owners and tenants are being helped. Special stress is laid on the production of home supplies for the family and live stock and on the improvement of sanitary and home conditions.

To supervise the work of the county men and women agents, State and district agents were

employed, who also aided in organizing new counties.

The boys' and girls' club work continued to grow in importance during 1916. Over 285,000 boys and girls were enrolled. In the Southern States this work was organically connected with the county-agent system; in the other States it was organized separately. The clubs are in many cases closely connected with the schools through the coöperation of State and local school authorities and the teachers. Often the club work is adopted as a home project and thus made a part of the school work. In many places paid local leadership for the summer vacation is being provided. This has resulted in a larger number of club members carrying their work through to completion. The prize feature of this work is being less emphasized and such prizes as are given are more generally encouragements to education, such as scholarships to short courses at agricultural colleges. Leading activities were the competitive growing of crops, raising of pigs and poultry, canning of vegetables and fruits, and making of home gardens. In many cases the financial returns from sale of club products were considerable. Congress made a special appropriation of \$15,000 for an exhibit of club work at the National Dairy Show at Springfield, Mass., October 12-21, 1916. This consisted of exhibits of products, demonstrations, and judging contests by teams of boys and girls from 10 North Atlantic States.

Short courses in various branches of agriculture and home economics, often called movable schools, were held throughout the country. These usually occupied from three to five days and were supplemented by numerous meetings of farm men and women. About 1500 movable schools were held in 1916, with an attendance of 200,000.

The force of extension specialists, with headquarters at the agricultural colleges, numbers over 1000 men and women, representing many branches of agriculture and home economics. These officers supplemented the work of the county agents, furnished them advice and assistance, gave instruction in the movable schools and meetings, prepared publications, and answered inquiries. Specialists were also sent out by the Department of Agriculture to work with the extension agents in such lines as tick eradication, hog cholera control, marketing of farm products, and home canning of vegetables and fruits. In 25 Northern and Western States the Department, in coöperation with the colleges and counties, conducted demonstrations in farm management. In 1916 analyses were made of the business of over 15,000 farmers, with the result that over 6000 began keeping farm accounts and many made changes in their methods of farming, putting it on a better economic basis.

For the fiscal year beginning July 1, 1916, the total fund available for extension work from Federal, State, and local sources was about \$6,100,000. Of this, about \$1,200,000 was derived from direct appropriations of the Department of Agriculture and \$1,580,000 from the Smith-Lever Act, making the total Federal contribution \$2,780,000. This was met by approximately \$3,320,000 from sources within the States, including \$1,100,000 to offset the equivalent allotment of Federal Smith-Lever funds, \$600,000 from additional State appropriations,

\$140,000 from college funds, \$1,245,000 from counties, and \$370,000 from local organizations and miscellaneous agencies. About \$3,100,000 was to be used for the demonstrations and other activities of the county agents. Much of their work bore directly on farm-home problems, but \$770,000 was allotted to distinctive work in home economics. More than \$350,000 was to be used for work among boys and girls. Over \$1,000,000 was to be devoted to the tasks of the specialists.

Farmers' Institutes were held in 1916 under the management of the State departments of agriculture in 10 States. The number of such institutes was 5010 (with 12,010 sessions), with a total attendance of 1,606,806. In 29 States the institutes were managed by the agricultural colleges, and were as a rule made a part of their extension work in agriculture.

**AGRICULTURAL LEGISLATION.** LEGISLATION IN THE UNITED STATES. The Federal legislation of 1916 was unusually important. The Legislatures of only 13 States were in session, but a number of laws of general interest were enacted by them, especially along economic lines.

The Federal Farm Loan Act, described elsewhere (see AGRICULTURAL CREDIT), was the most noteworthy measure of the year. An amendment to the Federal Reserve Act of 1913 extended the powers of some National Banks by permitting loans on farm lands outside their reserve districts but within 100 miles of the bank. South Carolina authorized a commission to consider the need of a State rural credit system. In New York, bonds of the State land bank were made legal security.

The United States Cotton Futures Act of 1914 was substantially reënacted, thereby overcoming the charges of unconstitutionality previously noted (see YEAR BOOK, 1915). The United States Grain Standards Act, under which the Secretary of Agriculture is authorized to establish official grain standards and to license grain inspectors, is described elsewhere (see AGRICULTURE).

The United States Warehouse Act established a standard warehouse receipt for cotton, grain, wool, tobacco, and flaxseed, and provided a voluntary system for the Federal licensing of bonded warehouses and warehousemen. It is believed that the receipts from these warehouses will constitute reliable evidence as to the grade, quantity, and ownership of the products for which they are issued, and thus become more easily and widely negotiable as collateral for loans and in this way assist in financing crops.

The licensing and bonding of commission dealers in farm produce was required in Virginia, where a division of markets was also established to study the cost of food production, assist in organizing cooperative societies, publish information on marketing questions, investigate complaints as to the transportation of farm products, etc. Rhode Island authorized the formation of agricultural or dairy cooperative associations under prescribed regulations. In Mississippi municipalities were prohibited from preventing by legal regulations retail sales of foodstuffs by the producer direct to the consumer. Aside from a levee tax on cotton, all farm products grown within the State were also exempted from taxation for two years after harvesting.

An appropriation of \$20,000,000 was made in the National Defense Act to construct and operate one or more plants for the manufacture of nitrates and similar materials. This action was taken primarily to insure a supply for munitions of war, but it was anticipated that the surplus would be available for the manufacture of fertilizers. The U. S. Department of Agriculture also received \$175,000 with which it was planned to erect an experimental plant for demonstrating the manufacture of potash from kelp on a commercial scale. Maryland authorized its State lime board to operate a plant to convert oyster shells into agricultural lime and sell the product to farmers at cost, and South Carolina attempted State purchases and sales to farmers of crushed marl and ground limestone.

The standardization of the so-called "Climax" grape baskets and similar containers for fruits and vegetables in interstate commerce is provided in a Federal law effective Nov. 1, 1917. The "Climax" baskets must contain two, four, or twelve quarts dry measure, while other types of baskets and containers used for small fruits, berries, and vegetables must be of one-half pint, one pint, one quart, or multiples of one quart dry measure.

A new apple-grading law was enacted in Maryland, and the Massachusetts law was amended. Provision was made in California for the grading and labeling of milk, and restricting the retail sale of all unpasteurized milk or dairy products, except cheese, to the product of animals passing the tuberculin test.

The Federal Seed Inspection Act of 1912 was amended to include vetch and rye grass, and by prohibiting the importation of seed of Kentucky and Canada blue-grass containing less than 50 per cent of live pure seed and of all other seed subject to the act containing less than 65 per cent of live pure seed. New seed laws were also adopted in Kentucky, Maryland, New Jersey, and Virginia.

Other inspection laws amended were those of South Carolina for fertilizers, Maryland and Virginia for agricultural lime, New Jersey and Virginia for feeding stuffs, and Maryland and Massachusetts for nursery stock. The inspection of apiaries was begun in Maryland and of creamery glassware in New Jersey. Stallion registration was required in New York. Oklahoma enacted a hog cholera law with a system of inspection and quarantine and regulations as to the production and use of serum, and Mississippi provided State compensation for animals condemned for contagious diseases.

The duties of the Maryland State Live Stock Board were transferred to the State Board of Agriculture. A system of State registration of cattle brands was provided in Mississippi, and the experiment station was directed to sell its surplus pure-bred eggs, chickens, hogs, and bulls to residents of the State at cost.

New Jersey established a State Department of Agriculture with a secretary, a State Board of Agriculture, and bureaus of (1) animal industry, (2) lands, crops, and markets, and (3) statistics and inspection. A State Agricultural Society was incorporated in Maryland.

The Virginia laws relative to larceny were amended by including the failure to perform farm labor promised in return for provisions.

A bill authorizing Federal appropriations of

from \$500,000 to a maximum of \$3,000,000 per annum for cooperating with the States in paying the salaries of teachers and supervisors of agricultural subjects in secondary schools, as well as a like amount for instruction in industrial subjects, and from \$500,000 to \$1,000,000 per annum for the preparation of teachers and supervisors along these lines, passed the Senate July 31, 1916. The passage of this measure was recommended by President Wilson in his address before Congress, December 5th. A somewhat similar bill was pending before the House at the close of the year.

In Massachusetts a special commission was appointed to study agricultural education as related to the Massachusetts Agricultural College and the development of the State's agricultural resources. Provision was also made through a referendum for the establishment of local schools under the supervision of the State Board of Education for teaching agriculture and horticulture to families and individuals in day, part-time, or evening classes. South Carolina adopted the policy of State aid to agricultural instruction in the public schools, and Mississippi prescribed a uniform course of study for its agricultural high schools.

**FOREIGN LEGISLATION.** Much of the agricultural legislation abroad dealt with conditions brought about by the European war, especially in relation to the conservation of the food supply, and is referred to elsewhere (see **AGRICULTURE; FOOD AND NUTRITION; etc.**).

In British Columbia and New Brunswick returned soldiers are to be given special privileges in the purchase of lands, and the receipts from the sale of these lands are to constitute a fund for loans to the soldiers for making improvements on their preëmptions. Provincial loans for drainage work were authorized in Prince Edward Island.

In order to encourage live stock improvement, the Bank Act of the Dominion was amended to permit bank loans to stock raisers with the live stock as security. Manitoba provided for the organizing of settlers into groups of 10, each member then to receive not over five head of cattle from the province, for which payment would be made in five annual installments. Saskatchewan amended its stallion registration law by requiring the enrollment of all males offered for service, and Manitoba by prohibiting the use of other than pure-bred sires. Alberta provided for additional live stock inspection and Quebec and Ontario for additional compensation to sheep owners for damages from dogs.

In British Columbia creameries, dairies, and milk testers must now be licensed and the value of milk and cream purchased certified to by licensed inspectors. Ontario also regulated testing, required payments on a basis of the fat content, and ordered the pasteurization of whey and similar by-products. Manitoba required the licensing of skimming and cream receiving stations, and Prince Edward Island authorized the closing of cheese factories not conducted in a sanitary manner. Manitoba enacted a new noxious weeds law and Nova Scotia provided for apiary inspection.

During the year the *Annuaire International Legislation Agricole*, the usual very complete annual compilation of the world's agricultural legislation, was issued for 1915 by the International Institute of Agriculture.

**AGRICULTURAL SOCIETY, NATIONAL.**  
See **AGRICULTURE.**

**AGRICULTURE. CROP CONDITIONS.** There were unusual difficulties in securing reliable data as to the crop conditions in Europe, and as a result the preliminary reports were late and at best estimates based on fragmentary data. The results issued by the International Institute of Agriculture at Rome near the close of the year showed that in the northern hemisphere the crops of wheat, barley, oats, and maize were decidedly less than in 1915, although the yield of rye was only slightly lower. Compared with the 5-year average, the 1916 crops of wheat and maize were seriously deficient, but rather larger than the average in the case of barley and oats, and decidedly so in the case of rye. The deficiency of wheat was nearly one-fifth compared with 1915. The area under wheat in Great Britain showed a reduction from the large acreage of 1915, but with that exception was the largest since 1899. The Argentine crop was estimated at about half that of 1915, but the Australian crop was placed about 4 per cent above the average. The Institute estimated the wheat crop of the world's most important producers at 2,500,000,000 bushels, or 25 per cent less than in 1915. The potato crop was below normal in many countries.

Among the general disadvantages which European agriculture has been under are a scarcity of labor, much of that available being unskilled, deficient supply and high price of fertilizers, difficulty of obtaining work animals, the high price and often scarcity of petrol for operating tractors and agricultural machines, the hindrance to trade in these machines, and the scarcity and rise in price of seed. The very high prices of forage, the requisitioning of large amounts for the armies, the reduction of certain feeds by closer milling to give a larger yield of flour, and the establishment of maximum and requisition prices in many states are among other difficulties which tended to interfere with production. Maximum prices were fixed during the year for wheat, rye, and oats in Germany, Austria, and Hungary, also for wheat in France and Italy, for oats in France, and for corn in Hungary and Italy.

In the United States 1916 was an off year for production of most of the large staple crops. The December estimates of the U. S. Department of Agriculture showed that wheat, corn, and potatoes were considerably below the crops of 1915 and the 5-year average; oats, rye, and barley were below 1915 but above the 5-year average; while hay was above 1915 and the 5-year average, and rice and tobacco were record crops. Cotton production was slightly above that in 1915, but more than two and a half million bales below the 5-year average. Spring wheat was less than half a crop and much of it was of poor quality and unfit for milling. The total wheat was far below last year's crop, and potatoes showed a shortage of nearly 75,000,000 bushels compared with the previous year and the average for five years.

Despite the relatively low yield of most crops, unusually high prices at the farm for most products gave the year's production a total farm value it has never before reached. The corn crop was valued at over \$2,000,000, and the wheat, hay, and cotton crops at over \$1,000,000 each at the farm. The combined farm value of

WORLD CROPS OF WHEAT, RYE, OATS, BARLEY, AND MAIZE, 1915 AND 1916 (IN BUSHELS)

	Wheat				Rye				Oats				Barley				Maize			
	1916	1915	1916	1915	1916	1915	1916	1915	1916	1916	1915	1916	1915	1916	1916	1915	1916	1915		
United States	688,886,000	1,011,505,000	47,888,000	49,190,000	1,251,992,000	1,540,862,000	180,927,000	228,851,000	2,588,241,000	2,994,799,000										
Canada	189,000,000	386,258,000	2,080,000	2,478,000	859,549,000	481,085,000	82,280,000	50,868,000	6,800,000	14,594,000										
Argentina		178,231,000		1,811,000		68,892,000		8,000,000		888,285,000										
Chile		19,002,000		150,000		7,105,000		8,750,000		1,822,000										
Uruguay		3,417,000		1,000		1,040,000		37,000		11,495,000										
Austria		60,000,000		105,000,000		184,000,000		75,000,000		12,000,000										
Hungary		189,470,000		49,075,000		89,925,000		61,186,000		180,550,000										
Belgium		14,864,000		8,000,000		42,600,000		4,000,000												
Bulgaria		42,850,000		8,890,000		9,700,000		17,670,000												
Denmark		5,830,000		17,890,000		58,000,000		25,898,000												
France		316,970,000		49,060,000		855,000,000		86,248,000		14,000,000										
Germany		151,800,000		445,672,000		592,050,000		158,480,000												
Greece																				
Italy		176,000,000		5,850,000		26,089,000		11,050,000		118,108,000										
Netherlands		4,026,000		12,400,000		22,240,000		2,495,000												
Norway		304,000		780,000		10,620,000		8,034,000												
Portugal																				
Rumania		78,850,000		4,675,000		28,988,000		80,020,000		15,000,000										
Russia, Europe		548,870,000		840,000,000		999,808,000		492,168,000		110,280,000										
Russia, Asia		151,000,000		82,714,000		107,700,000		86,770,000		74,806,000										
Serbia																				
Spain		189,298,000		81,500,000		84,980,000		84,880,000												
Sweden										26,827,000										
Switzerland		4,048,000		2,170,000		6,794,000		629,000												
Turkey, Europe										157,000										
Turkey, Asia		85,000,000																		
United Kingdom		60,550,000				195,169,000		55,255,000												
British India		317,840,000						40,000,000												
Japan		24,890,000				5,016,000		99,766,000		8,748,000										
Algeria		34,925,000				18,685,000		45,875,000		485,000										
Egypt		26,520,000						18,175,000		68,875,000										
Tunis		11,028,000				2,067,000		6,885,000		228,000										
Australia		25,626,000						5,000,000												
New Zealand		6,854,000						11,797,000		616,000										

the principal farm crops was \$7,113,151,000, as compared with \$5,421,390,000 in 1915, showing that large crops do not necessarily mean correspondingly large financial returns to the farmers. As a matter of fact, as has recently been shown by a statistical study, bumper crops with all the extra labor they involve usually bring the farmers shorter returns than the lean ones, and especially so when considered on a world scale.

The Secretary of Agriculture called attention in his annual report to the sharp fluctuations of yield and prices from season to season which tend to stimulate speculative and superficial farming, and urged as one of the greatest agricultural needs the stabilizing of production. In a large measure this must be brought about through the use of better adapted or improved crop varieties, more systematic and rational crop rotations, and improved agricultural practice generally, including in many sections larger attention to live stock production.

**WORLD CROPS.** The International Institute of Agriculture at Rome has issued estimates of the world crops of wheat, rye, oats, barley, and maize (corn) as shown in the accompanying table. In these estimates, the production in Germany, Austria-Hungary, Belgium, Bulgaria, Denmark, France, Rumania, Russia in Asia, Algeria, and Sweden is assumed to be the average for the five years 1909-13, as the returns for 1916 for these countries are incomplete.

**AGRICULTURE AND THE WAR.** The effects of the war on agriculture have continued to transcend all other matters relating to that industry in Europe. With the progress of the war, the preëminent position of agriculture in the welfare of the countries involved and as an element in the national defense has become more evident. Its importance is now conceded as second only to that of the military activities. The problem of maintaining, and in most cases increasing, the production of food for man and beast has taxed to the utmost the farming resources of the countries at war. With thousands of acres devastated, relations with other countries interrupted, and a vast number of the farmers and farm laborers drafted into the army, not only unusual demands but unusual conditions have been imposed. Some of the countries have in the past been more largely self-sustaining than others, but all have felt the necessity of extreme measures to make them increasingly reliant on their own food production, either by reason of blockade or of economic policy.

The first efforts in the various countries centered largely on providing the machinery for gathering in and saving the crops, but as time has gone on the necessity has become apparent of providing for the continuance of agriculture on the highest possible plane,—of maintaining the fertility of the land, of preventing the depletion of live stock, of avoiding waste of all kinds, and often of discovering and utilizing new sources of supplies. To accomplish these ends organization has been greatly extended, and in many cases unusual powers have been conferred.

The force of the situation is illustrated by the fact that in 1915, when the wheat crop of Great Britain was the largest for many years, three-fourths of the wheat supply of the country had to be imported. In that year the United Kingdom imported agricultural products valued at \$1,342,000,000 and France imported food prod-

ucts worth \$492,000,000. In Great Britain two-thirds of the total area of cultivated land was in permanent grass, prior to the outbreak of the war, and only one-third in cultivated crops, whereas in Germany the proportion was exactly reversed. Moreover, agriculture in Great Britain was on a less efficient basis than that of Germany, as the president of the Board of Agriculture pointed out in an address the past summer, in the course of which he declared that if agriculture had made no more progress in Germany than it had in the United Kingdom during the 20 years preceding the war, the German Empire would have been at the end of its food resources long before the second year of the war. He explained further that the war was being fought by Germany quite as much on an agricultural as on a military organization of the nation.

To overcome its disadvantage in cultivated land and to provide land and labor for food production, the most urgent appeals have been made in Great Britain and numerous measures adopted to readjust the systems of farming. War agricultural committees and borough war food societies have sought to bring assistance to the farmers in the matter of information, labor, seed, fertilizers, etc., and to secure additional land for allotment to small farmers. Attention has been turned to the cultivation of land not ordinarily employed in agriculture, to the breaking up of grass land and pastures, the cultivation of parks and pleasure grounds, the employment of waste woodland for raising pigs, etc.; and farmers have been urged to shorten the period of grass and clover in rotations, and to reduce the acreage of bare fallow.

In England and Wales the area of arable land was increased in the crop year of 1916 by something over 85,000 acres, largely through the breaking up of permanent sod, but there was harvested in that year over a quarter of a million acres less of wheat than in 1915, with a consequent decrease in the production of that cereal. Great pressure has continued to be brought to bear on farmers to extend the raising of wheat.

Similarly in Germany the need for the largest possible production of food has been impressed upon the people and effective measures provided to accomplish that end. The thorough cultivation has been urged of every available piece of land on farms and in towns, and societies have been formed to take the work in hand and see that it is carried out. The crops for which there was most need have been indicated, and the whole question of production has been systematized. During the year an Imperial Office for Vegetables and Fruit was established to further the production and preservation of fruit and vegetables, with power to provide for the growth of the necessary amount of these supplies and their preservation. The authorities took over the fruit crop of the entire country for making jams and preserves for the army.

In France, organization has been carried to a high degree. Agricultural committees have been formed in each commune, which not only form a part of the government's plan for mobilizing agricultural labor, but are also responsible for the cultivation of farms or holdings which have fallen out of use, with power to commandeer such land, and are active in the supply of seeds, fertilizers, and other necessities for farming. In the districts of France that have been invaded,

the needs of the peasants for horses, implements, seeds, fertilizers, forage, etc., were supplied in part by gifts and in part by governmental loans made through the credit banks. Steps were taken to increase the amount of gardening carried on, by putting the opportunity for cultivating gardens within the reach of even the humblest; and school masters were employed to instruct the children in gardening and to carry on model gardens.

In Great Britain, also, the attention of the elementary schools was called to ways in which they could increase the food supply by gardening, collecting wild fruits, raising poultry, rabbits, pigs, bees, etc., and by canning and making preserves.

A provisional law in Turkey, enacted during the summer, authorized a special appropriation of nearly \$2,000,000 to be used for purchasing seed grains for poor farmers.

The Royal Agricultural Society of England last year organized a fund for the agricultural relief of the Entente Allies in the regions devastated by war, and distributed through the French government live stock, agricultural implements and machinery, and considerable amounts of seed.

There has been a widespread effort to prevent the depletion of the live stock of the warring countries, especially the work animals, milch cows, and breeding stock. In view of a tendency in Great Britain to dispose of cows on account of existing and anticipated shortage of labor, or owing to the reduced allowance of petrol for running milking machines, the Board of Agriculture has made every effort to help dairymen to retain indispensable laborers and has urged the training of women for milking. Statistics collected in June, 1916, showed that the live stock in England and Wales had not only been maintained but that a larger number of cattle were on hand than at any recorded date in history.

In Germany an order has been issued, to take effect in the spring of 1917, forbidding wild game to be fed with fodder which is adapted to feeding cattle, a measure which has aroused much opposition from those interested in game preserves.

The high price and scarcity of copper have led to efforts to secure substitutes for copper salts in fungicides for spraying. In France unusually heavy losses were sustained from black rot in the vineyards, because of inability to spray as much as usual. The hot water method has been reverted to in treating seed for smut, and lime-sulphur spray is being given wider use. Everywhere special stress has been laid on the control of diseases and other injuries of standard crops, like cereals, potatoes, and beets, to protect the food supply; and efforts have been made to prevent losses due to wild animals, birds, etc., which feed on farm and garden crops, by the killing off of these animals. The planting of good seed which will yield large returns has also received attention, and special provision has been made to provide such supplies. In Germany there has been much activity in the fixation of nitrogen from the air, for general uses and for fertilizers, some marked advances having been made in the direction of efficiency and economy. Small beets, apple culls, beet residues, etc. are being employed in alcohol making, and many studies are reported on vegetable sources of oil.

The testing of farm machinery has been given special impetus by the shortage of labor, and in some sections coöperative farm implement societies have been formed to provide funds for their purchase or coöperative ownership. Of late, however, some difficulty has been experienced in securing the allotment of petrol for their operation. It was announced during the summer that the Italian government contemplated extensive purchases of labor-saving agricultural machines to meet the difficulty caused by lack of farm hands, a new experience in that country. The purchase of tractors and power machinery has also been encouraged in France by grants from the government and from one of the railway systems.

**AGRICULTURAL LABOR IN EUROPE.** The greatest difficulty in maintaining agriculture has centered in the labor problem. This has been felt in all the warring countries and has been a subject of special consideration. Soldiers and reservists have been employed to an increasing extent, army regulations being made increasingly favorable to this, and civilians have been exempted in order that they might render war service in the field of agriculture.

In August the British Army Council decided to release some 27,000 soldiers to assist with the harvest, these to be allotted to the various districts on application of farmers through the local labor exchanges. Instructions were also issued that as far as possible there should be loaned to farmers draft horses, mules, and drivers for help in harvesting in the neighborhood, payment to be made at fixed rates. In October, the Council decided to suspend the calling out of men employed in agriculture until April, in case they were needed to maintain milk production, except as substitutes were provided from men serving in the reserve. A labor scale has been established, having reference to the labor which should be left on farms to insure a reasonable standard of cultivation, and a census of male and female workers employed on agricultural holdings was taken by the War Office in November. The difficult situation with respect to labor was succinctly set forth by the president of the Board of Agriculture toward the close of the year in the statement that "The nation must have more food, agriculture requires more labor, and the army claims more men."

During the year a volunteer movement was started in England to provide harvest labor, which resulted in the registration of school masters, school boys, clerks, and men over military age.

France also exercised increasing liberality in allowing unoccupied soldiers to work on the land, volunteers being called for from among those accustomed to manual labor. The right of mobilized farmers to receive such permission to labor at opportune times was recognized, and in order to avoid unfavorable reflection upon such, the idea was widely disseminated that soldiers thus volunteering to assist in farm work were not to be regarded as "shirkers" but men doing a double patriotic duty. The matter of supplying soldier labor has been systematized, the agricultural committees of the communities ascertaining the labor needed and making application to the general commanding the district. A French commission on agricultural labor, appointed in 1915, listed French and Belgian refugees for employment, and made efforts to recruit

agricultural labor from other countries, notably Spain.

Germany devoted special attention the past year to the harvesting of crops. In many cases public work of all kinds was interrupted in order to set free labor for the farms. Unusual labor, especially that of women, was applied on a large scale, the help of school children was enlisted in gathering the potato crop, and furloughs were extensively granted by the military authorities.

The employment of prisoners of war has also increased. This was at first unpopular, especially in France and Great Britain, but such satisfactory results were secured and the prisoners were found so submissive that the practice has spread widely. Employers are required to pay prisoners wages, in England the same rate as to English laborers. Prisoners have been organized into large companies, with those suited to particular kinds of work grouped together, and have traversed the different districts of the country at the time needed.

But in spite of these provisions, women have been the chief source of new labor, and high tribute has been paid to the way in which they have met the call upon them. This service has not been confined to peasant women and those accustomed to work in the fields, but has included many who had not done such work before the war. What the French women especially have done in taking the place of the men has been extolled in reports brought back by visitors to that country. In the appeals to them it has been explained that no work is inferior at such a time, but that everything is great which is of service to the country.

Early in the year the British Board of Trade, in conjunction with the Board of Agriculture, took active steps to mobilize a large supply of women for farm labor. Stirring appeals were made to all women to train themselves to take a man's place, to work a part of every day if they could not give their whole time, to cultivate their own gardens and allotments thoroughly, to keep pigs and poultry, and to see that there was no waste of fruit or vegetables.

Women organizers were placed in the field, county farm labor committees were established, and a scheme of systematic propaganda was carried on in all parts of the country, even extending to a house to house canvass. Later the Woman's National Land Service Corps was formed to assist the women's farm labor committees and to take part in the national campaign. To meet the need for training of women volunteers, a large number of counties made provision for instruction of women and children in light farm work. In some sections crèches to care for the children during the day have been found necessary to release the mothers, and a movement for day nurseries was started. A costume for women laborers was designed and placed on sale by the Board of Agriculture; and in recognition of the patriotic spirit of such women workers the same agency issued certificates "emblazoned with the royal arms and colors," and an armet to those who actually performed 30 days of such work.

In sections where women's work was unknown, farmers were often skeptical as to the possibility of securing help from them and as to the value of their services on the land. To convince farmers of their fitness and their willingness, agricul-

tural demonstrations by women were held in many sections, with a considerable number of entries for such competitions as plowing, handling teams, and even shearing sheep. Not only women of the industrial but of the educated classes have taken up this service. The results are reported as having been very satisfactory and affording a considerable measure of relief.

AGRICULTURE AFTER THE WAR. Already attention is being directed to this subject and to the placing of disabled soldiers on the land. A committee in Great Britain has rendered a report on the employment of ex-service men in farming after the war. Of the large number of men taken from farm work, it is expected that only about one-fourth will be able to return to it, which will result in a considerable shortage of agricultural labor. This indicates the need of attempting to settle on the land ex-service men not previously employed in farm work, and some of the millions who will be thrown out of employment after the war. As a beginning, the Board of Agriculture has already announced that an estate of 2363 acres of land has been acquired in Yorkshire for a land settlement colony of ex-service men. The colony will consist of a central farm of about 200 acres and a large number of small holdings for mixed farming. Applicants will receive preliminary training on the central farm where necessary, and be paid wages until such time as they are capable of working a holding independently. Coöperation will be followed in the purchase of supplies and the consignment and disposal of produce. Much interest is felt in this experiment.

In British Columbia a soldier's homestead act has been passed providing a free grant of land and a loan of money for improvements, with exemptions from taxes except for school purposes and five years' exemption from seizure for debt. Courses of instruction are being arranged for such settlers, and the government is making special allowance for the maintenance of the men and their families while this is being taken. Favorable conditions for the acquisition of land by returned soldiers were also made in New Brunswick.

In South Australia an act has also been put into effect providing for the settlement of returned soldiers on crown lands set aside for the purpose, the land to be leased perpetually or for a term of years. Provision is made for financial aid to such settlers in preparing the land, erecting buildings, purchasing implements, live stock, etc., interest on such loans and also the rent to be wholly or partly remitted in cases of hardship.

In the past year the various sections of the British Association for the Advancement of Science were asked to give consideration to the means of meeting problems which will arise after the conclusion of the war. In accordance with this request, the president of the Section of Botany dealt in his address largely with the economic and applied aspects of that science, and the president of the Section of Agriculture dealt with The Possibilities and Prospects of Increased Crop Production. Special attention was given to a consideration of the means of increasing the yield per acre and the certainty of production, and of reducing the cost per acre. He also referred to the need of agricultural education, to raise the ordinary farmer to the level of the good one, to the extension of the area of land under cultiva-



tion by the reclamation of waste, and to the substitution of arable crops for grass.

The former director of the Rothamsted Experiment Station in England, Mr. A. D. Hall, has issued a book entitled *Agriculture After the War*, in which he presents his views of the methods to be adopted in order to develop agriculture to the full extent demanded by the national needs. He insists that more food must be grown at home as an insurance in time of war, to develop the home resources and reduce foreign indebtedness, and to increase the agricultural population as an exceptionally valuable element in the community. This can be accomplished only by bringing more land under the plow. On their own responsibility farmers will not plow up grass land to put in crops involving greater risk, and Mr. Hall suggests that the state may be driven to adopt some system of bounties or protective duties to make the profits from arable farming more certain and the inducements more tangible.

**BRITISH AND GERMAN AGRICULTURE.** Perhaps nothing better illustrates the full realization of the seriousness of Great Britain's agricultural policy, in the present supreme test, than the publication by the Board of Agriculture during the year of a pamphlet entitled *The Recent Development of German Agriculture*, by Mr. T. H. Middleton, assistant secretary of the Board. This represents a frank attempt to explain why it is that in recent years German agriculture has made such a rapid advance while in England the production of food from the soil has decreased. Mr. Middleton shows that the ascendancy of the German over the Briton in agriculture has been gained in the past 40 years. The soil and the climate of Germany are both less favorable to agriculture than those of Great Britain, but the German farmer employs his land to better advantage in producing food crops, with the result that he feeds from 70 to 75 persons per 100 acres of cultivated land, whereas the British farmer feeds from 45 to 50. The reason for this striking difference is found in part in the fact that in Germany less than one-third of the cultivated land is in grass, while in Britain more than two-thirds of the cultivated land is used for that purpose. While there has been a slight decrease in the area annually plowed in Germany, in England and Wales the plowed area decreased by about 26 per cent in the 40 years before the war. A further immediate cause of higher production is the intelligent and efficient use of fertilizers, promoted by a well-organized system of agricultural instruction, the amounts of nitrogen, phosphate, and potash used being several times as large as on an equal area of cultivated land in Great Britain. It is admitted also that the soil has been better cultivated, plants and animals have been improved in type, and sanitary laws have led to a great improvement in the health of live stock.

Furthermore, much significance is attached to the fact that the German economic policy has favored agriculture—the growing of food as a measure for the common good of the country, while Great Britain's policy has been to import it. Germany's plan for safeguarding and encouraging agriculture has been far-reaching, including a splendid system of agricultural instruction and investigation, the provision of agencies for leadership, better business methods, and the employment of the profits of agriculture in further developing the means of production.

The necessity for agricultural instruction and experimentation is emphasized, and the conclusion is reached that for the increase of home-grown food supplies capital and labor are essential, and that "without security for capital and security of labor the extension of arable farming is not possible."

**FARM CREDIT.** For details of the important Federal Farm Loan Act, of July 17, 1916, see the article **AGRICULTURAL CREDIT**.

An agricultural credit act, passed in British Columbia in 1915, became effective in April, 1916. Agricultural bonds to the amount of \$1,000,000 were disposed of by the provincial government, making available a fund for immediate loans to farmers. Another sale of farm loan bonds is planned. It is expected that the new law will stimulate agriculture in the Province.

**GRAIN STANDARDIZATION.** To enable the grower to sell his grain on its merit and to afford greater security in buying and selling, a Grain Standards Act was passed by the U. S. Congress in the summer of 1916. The act authorizes the Department of Agriculture to establish official standards, to license grain inspectors for grading shipments in interstate and foreign commerce, and to act as referee in disputed cases. The standards fixed by the Department will supersede all previous standards, and no interstate or foreign shipment can be made by grade except subject to grading and certification by inspectors. Sales by sample, type, brand, or trade name are, however, allowed as in the past. These inspectors are not government employees but are licensed and supervised by the Department; and penalties for false grading are provided. In order to provide for the supervision and appeals under the law, the Department has divided the country into 32 districts, in each of which there will be an office of Federal grain supervision, usually in charge of a supervisor or board. Official standards have been issued for corn, consisting of six grades each for white, yellow, and mixed corn, and also a sample grade. Standards for wheat and oats are in process of determination, and studies are under way for ascertaining the basis for standards for other grains, including the grain sorghums.

**GUAYULE.** Rapid-growing strains of this shrub of high rubber content have been produced from wild plants in Arizona, and are now being developed as a commercial source of rubber. A large plantation was established the past season near Tucson, Arizona, by one of the leading rubber companies, and an expert placed in charge. Although employed to some extent in Mexico, this is the first attempt to cultivate and use the guayule commercially in the United States.

**MEETINGS AND ORGANIZATIONS.** The Second Pan-American Scientific Congress, at Washington, D. C., Dec. 27, 1915, to Jan. 8, 1916, devoted much attention to matters of agricultural interest and adopted important resolutions relating to agriculture and forestry.

At the Columbus meeting of the American Association for the Advancement of Science, at the close of 1915, the Section of Agriculture presented a programme on "The Relation of Science to Meat Production." The same Section at the New York meeting of the Association, at the close of 1916, held a symposium on "The Adjustment of Science to Practice in Agriculture," and the address of the retiring Vice-President,

financial prosperity. Among the most important events have been adoption of prohibition and of a general eight-hour law, the construction of railways—governmental and private, the institution of Federal land surveys, and the enormous increase both in the amount and value of the copper output. Gold-mining continued to be productive, fisheries flourished, and the forests began to remunerate. As a whole the condition of the natives improved steadily though slowly. Through separate reservations, Federal schools, vocational training, reindeer breeding, admission as citizens, village councils, sanitary improvements, and self-governing villages, the natives have risen in the social scale and in civic usefulness.

**POPULATION AND TOWNS.** The Governor, J. F. A. Strong, estimated the population in 1916 at 75,000, of whom 25,000 were natives. Twelve of the 16 incorporated towns made assessments in 1916, the values aggregating \$14,656,697. The assessments and tax rates were as follows: Cordova, \$909,465, tax per cent .05; Douglas, \$566,933, 1.0; Fairbanks, \$2,856,903, 1.5; Juneau, \$3,547,400, 2.0; Ketchikan, \$1,172,750, 1.5; Nome, \$1,531,359, 2.0; Petersburg, \$250,250, 1.0; Seward, \$1,716,927, 2.0; Skagway, \$606,917, 1.0; Tanana, \$500,000, no tax; Valdez, \$795,572, 2.0; Wrangell, \$202,161, 2.0. The new town of Anchorage, at the mouth of Ship Creek, Cook Inlet, is of considerable size and already provided with plants for railway work, schools, banks, etc., but it is not yet incorporated. A townsite, called Nenana, has also been laid out at the junction of the Tanana and Nenana rivers.

**LAWS.** As Congress authorized biennial sessions only, the Alaskan Legislature did not convene in 1916. In 1915 a law was enacted for passing at the general election of November, 1916, on labor and liquor questions, through the popular vote. By a large majority it was voted that after Jan. 1, 1918, spiritous liquors should not be manufactured, sold, transferred, or given in the Territory, and by a very large majority the provisions of the eight-hour day law were made general for all wage and salary earners. Under the provisions of the act the Legislature in its session, commencing in March, 1917, must pass acts necessary to carry out the wishes of the electors.

**TERRITORIAL BANKS.** All banks must be either national or territorial. There are three national banks, located at Juneau, Fairbanks, and Seward. Under recent legislation private banks have been abolished, and in their stead are 14 territorial banks, four having been organized during 1916. They are at Anchorage (two banks), Cordova, Douglas, Fairbanks, Iditarod, Juneau, Ketchikan, Nome, Petersburg, Seward, Skagway, Valdez, and Wrangell.

**MINERAL PRODUCTION.** Data as to the record-breaking productivity of the mines of Alaska during 1916, have been drawn, as usual, from the preliminary report, dated Jan. 1, 1917, of Mr. Alfred H. Brooks, Chief of the Alaskan Division, United States Geological Survey. It is believed that the values thus obtained will not vary over 4 per cent from the final revision, as in 1915 they were an underestimate of less than 3 per cent. As will be noted, the increase in values during the year 1916 far exceeds that of any previous year, yet the maximum increase in percentages is less than that of 1915. The total production in recent years was: 1914, \$19,065,-

666; 1915, \$32,854,000, an increase of 77 per cent; 1916, \$50,900,000, an increase of 65 per cent. Though the enormous rise of values for 1916 was mostly due to the large tonnage and unprecedented increase in the price of copper, yet practically all the other minerals were mined in greater quantities than ever before. While it is to be anticipated that the price of copper will materially decrease, yet developments of new deposits of copper and of gold will largely increase the output in a few years, and so ensure a continuous, healthy growth of the Alaskan mining industries. As copper has displaced gold as the most productive mineral of the Territory, so in due time it is possible that coal may displace copper, in value if not in importance.

A notable increase in mineral values was that of silver—largely due to the immense amount of copper ores—from \$543,393 in 1915 to \$950,000 in 1916. The value of the less productive Alaskan minerals in 1915 and 1916, respectively, was as follows: tin, 1915, \$78,846, 1916, \$120,000; lead, \$41,118 and \$110,000; antimony, \$74,000 and \$60,000; tungsten, none and \$60,000; coal, \$3300 and \$30,000; gypsum, petroleum, marble, etc., \$272,299 and \$130,000.

The total mineral output of Alaska in its 32 years of mining has exceeded \$352,000,000 in value, distributed as follows: gold, \$277,909,943; copper, \$67,319,581; silver, \$3,774,911; antimony, lead, petroleum, tin, etc., \$3,184,111.

**Gold Mining.** The gold production of 1916 was valued at \$17,050,000, the increase having been continuous for three years, the amounts being in 1913, \$15,626,813; 1914, \$15,764,259; and 1915, \$16,702,144. About 4600 men were engaged in the placer diggings, which numbered 640 during 1916. Their output was \$10,640,000 against \$10,480,000 in 1915, and \$10,730,000 in 1914. The placers in recent years have produced the following percentages of the total output: 1912, 71 per cent; 1913, 68.4; 1914, 68; 1915, 62; and 1916, 62 per cent. These percentages indicate the trend of the mining industry. The 25 gold-lode mines operated in 1916 produced \$6,200,000, against \$6,069,000 from 28 mines in 1915. The only important centres of quartz-mining are in Southeastern Alaska, especially in the Juneau district. The lodes of the Fairbanks district await the completion of the railroad, which will bring cheaper fuel. The Treadwell and the Alaska Gastineau mills are the great lode-producers. As usual the largest amount of gold was mined in the Yukon Basin,—almost entirely from placers—in the principal districts as follows: Iditarod, \$2,000,000; Fairbanks, \$1,800,000; Ruby, \$800,000; Hot Springs, \$750,000; Tolovana, \$500,000; Marshall, \$400,000; Koyukuk, \$300,000; and Circle, \$250,000. The important new gold camps are Tolovana, 50 miles northwest of Fairbanks, and Marshall, on the Yukon not far from the delta. The total Alaskan gold output, aggregating to Jan. 1, 1916, \$260,858,943, was mined by districts as follows: Pacific Coast Belt, \$76,529,291; Copper River and Cook Inlet Region, \$46,613,783; Seward Peninsula and Northwestern Alaska, \$71,562,700; Yukon Basin, \$106,423,169. In 1916 the districts in order named produced \$5,960,000; \$1,090,000; \$2,900,000; and \$7,100,000. Up to the present time, 1916, gold has been largely obtained from placers, which have yielded \$186,192,943, while \$73,558,184 has come from the silicious ores, and \$1,107,787 from cop-









per ores. Silver was mined from placers to the value of \$567,835; silicious ores yielded \$658,843, and copper ores, \$1,295,233.

**Coal Mining.** The coal-bearing rocks of Alaska cover thousands of square miles, and the possible production of good coal, much of high order, runs into hundreds of millions of tons. Yet in the 16 years, 1899-1915, there were imported into the Territory 1,750,814 tons, while only 40,369 tons were mined in Alaska. Fortunately the Federal law of December, 1914, renders practicable the mining of coal in the Territory. The principal coal-fields are those of Bering River, Matanuska, and Nenana. They are now open to the public through the completion in 1916 of the detailed surveys, the classification thereof, and the designation of the sections reserved for governmental use. Six applications for leasing privileges have been made and are under consideration. Mining privileges, covering areas of not over 10 acres, have been made free of cost and are being utilized for industrial and domestic purposes, at 15 points. From the Moose Creek mine, in the Matanuska Valley, shipments were made for use on the government railway, while the mine at Bluff Point, Cook Inlet, has supplied the neighboring local markets; in all about 5000 tons have been mined.

**COMMERCE.** Current prosperity in Alaska is reflected in its greatly increased commerce. The volume of merchandise shipments, including minerals, aggregated for the fiscal year 1915 \$71,352,276, which increased in 1916 to \$97,340,420, an advance of 36 per cent. Yet more striking are the shipments for 10 months,—January to October, for 1915 and 1916. Total shipments to the Territory, 1915, \$20,874,231; 1916, \$28,404,993, an increase of 41 per cent. Shipments from Alaska, including all minerals, 1915, \$41,003,254; 1916, \$66,341,096, an increase of 61 per cent.

**FUR SEALS.** The North Pacific Pelagic Sealing Convention of July 7, 1911, remains in force, and is strictly observed. Sealing on the Pribilof Islands is still prohibited, the closed season terminating according to existing law on Aug. 24, 1917. The increase of the herd has been satisfactory, the censuses showing the following numbers: 1914, 294,700; 1915, 363,877; and 1916, 417,329, of which 116,977 are breeding cows. There were slaughtered for the use of the natives of the Pribilofs 3947 seals in 1915 and 5392 in 1916. To conserve the interests of the United States, Secretary of Commerce Redfield by restrictions on the sale of fur-seal skins brought about the establishment of a dressing and dyeing plant, a novel American industry. At St. Louis, on Sept. 20, 1916, 1900 such dyed seal skins were sold at remunerative prices. Through improved administration the 314 natives of the Pribilofs are said to be better educated, fed, and housed than any other community of natives in the Territory.

**FOX-FARMING.** No additional islands have been leased for fox breeding. The leases expire in 1919 on the following islands: Carlson, Little Koniuji, Middleton, and Simeonof. Other fox farms exist in Southeastern Alaska, in the Kodiak-Afognak and Copper Centre regions, along the Tanana and Yukon rivers, and in the Aleutian chain. Not including the Pribilofs there were shipped out of the Territory in 1915 fox-pelts as follows: black, 8; blue, 382; cross, 1360; red, 11,770; silver-gray, 187; and white,

5967; total valued at \$238,401. From the Pribilofs fur-pelts came as follows: 1914, 256 blue, 25 white; 1915, 253 blue, 40 white; 1916, 420 blue, 20 white. Pelts are lower than in 1915, the average value of silver-gray being in 1916, \$150, and of black pelts, \$400.

**MINOR FUR-BEARING ANIMALS.** Excluding foxes the value of the pelts in 1915 was \$162,131. The principal skins were 782 bear, 9374 lynx, 3028 marten, 980 land otter, and 23,079 minx. To prevent extinction the killing of marten was forbidden until Nov. 15, 1921.

**REINDEER INDUSTRY.** Year by year the breeding of reindeer is extending its field and increasing its benefits for the natives of Alaska. In 1916 the first attempt was made to introduce the deer into Southeastern Alaska, eight deer being sent to Metlakatla. The last available census was made on June 30, 1915, when there were 70,243 animals in 76 herds. This was an increase over 1914 of 12,461 head, not including 9000 which had been slaughtered for food and skins. As the annual increment exceeds 21 per cent, the aggregate number in 1916 approximates 85,000. Two-thirds of the deer, 48,683 head, are owned by 1140 natives. Lapps and other whites own 1362, the missions 6890, and the United States retained 3408. The largest herds are at or near Bethel, in the Kuskokwim Valley, where there are more than 11,000 deer. A convention of deer breeders was held in 1916 at Igloo, Seward Peninsula, with great benefit to the assembled natives, who exchanged views as to the best methods of driving, training, slaughtering, etc. Besides the food, skins, etc., obtained for their domestic use, the natives had an income of \$81,997 from the sale of meat, hides, etc.

The deer problem assumes a new phase through its diversion, in part, to commercial purposes. A corporation has purchased some 2000 animals from the Lapps and from a mission. This looks to the introduction of deer meat generally. While the surplus male deer are available for food, any further inroads seem injurious to the interests of the natives, for whom the United States imported the deer.

**NATIVES.** Classified as Indians, the natives of Alaska numbered 25,331 in 1910; in the aggregate no material change has since occurred. In health, intelligence, and material prosperity the Indians of Southeastern Alaska stand first. The fisheries gave employment in 1916 to about 5000 natives. Some natives have registered as citizens under a recent Territorial law. There is a growing tendency among them to segregation on reservations and in self-governing villages, where opportunities of improvement are greater. In most villages there are councils of the best natives, who shape public opinion and control politics. Coöperative stores have been operated with benefit at Atka, Hydaburg, Klawock, Klukwan, and St. Lawrence Island. During 1916 reservations were established for the natives at Tyonek, Cook Inlet, and at Noorvik, in the Kobuk Valley, making a total of 11. Hospitals for the sick are maintained at Kotzebue, Kanakanak, and Nulato, while under contracts natives are admitted to hospitals in Candle, Juneau, Nome, Seattle, and Valdez. Under Superintendent W. T. Lopp, United States Bureau of Education, there were maintained during 1916 69 schools, with an enrollment of 3436 pupils and an average attendance of 1963. These schools, excellent as a rule, teach domestic

and industrial methods,—cooking, sewing, canning, etc., to the girls; carpentry, gardening, etc., to the boys. Medical aid is provided to some extent, principally in sanitation, segregation in epidemics, etc. Despite inadequate equipment, isolation in service, and insufficiency of personnel, it is evident that the doctors and teachers have largely contributed to the uplift and advancement of the natives of the Territory.

**SURVEYS.** The United States Geological Survey continued its valuable work, which has covered nearly every area of economic importance in the Territory. To include 1915 its geologic surveys covered 29 per cent of total areas, and its topographic work 33 per cent. In 1916 its surveys covered 21,312 square miles, 10,900 being geologic. The Coast and Geodetic Survey, by its steamer *Yukon*, has explored the delta and the upper reaches of the Kuskokwim River above Bethel. Sea-going ships can now reach Bethel, and river-boats reach McGrath 500 miles further up-stream; this increases to 1200 miles the navigable waters of this valley. Certain stretches of the Kuskokwim had been erroneously charted, some points being as much as 50 miles in error. The Coast Survey also continued work on the Inside Passage, where its system of wire-dragging disclosed pinnacle rocks and other menaces to safe navigation.

**TELEGRAPHS.** The United States Signal Corps system connects Seattle with nearly every place of importance, reaching Nome in the northwest and Eagle in the northeast. It operates 2627 miles of submarine cables with 19 stations, 848 miles of land-lines with 29 stations, and routes of 3721 radio-service with 10 stations. The rates were again reduced Oct. 1, 1916, from 15 to 50 per cent. The Pribilofs and Cordova are served by the radio system of the navy. Private telephones connect Nome with Kotzebue Sound, and Fairbanks with adjacent mining camps.

**AIDS TO NAVIGATION.** During 1916 the Light House Board established 35 lights, 5 beacons, and 18 buoys. Its most important work has been the completion of the much-needed lighthouse at Cape St. Elias, on Kayak Island. The United States Coast Survey has continued its wire-drag surveys through the Inside passage, discovering many perilous pinnacle rocks.

**HOMESTEADS AND TOWNSITES.** In connection with the construction of the governmental railway, the United States Land Office has surveyed three townships—an area of 354,165 acres. Townsites have been opened in the Cook Inlet region at Anchorage and Wassalia, and in the Tanana Valley at Nenana. Homestead entries have largely increased in the same sections, though the great cost of surveys—which in Alaska alone devolve on the settler—deters entries. The Congressional Act of July 8, 1916, permits entries up to 160 acres, except on reservations and leased fox-farms.

**AGRICULTURE.** The Alaska Agricultural Experiment work has continued along lines calculated to develop grains, vegetables, fruits, and stock suited to the soil and climate. The crops of hay and vegetables steadily increase. Holstein cattle have been taken to Kodiak for crossing with the Galloways, and the introduction of the Siberian yak is suggested. Farms and gardens have increased their output in the Tanana Valley and in the Southeastern Archipelago. Stimulated by the railway construction large numbers of farms, 400 it is said, have been

opened in the region to the north of Cook Inlet.

**RAILROADS.** Far the most important event in Alaskan affairs is the construction of a railway by the United States, which has rapidly advanced during 1916. The Alaskan Northern Railway, extending 71 miles from Seward northward on Kenai Peninsula, has been rebuilt, and work is under way to connect this section with the main line on Knik Arm. To facilitate the opening of the coal district in the Matanuska Valley, original work of construction was begun at Anchorage, at the mouth of Ship Creek, Cook Inlet. Here a complete railway town was built. It has dock and lighterage facilities, repair, round, and machine shops, ware and employee houses, waterworks, telephones, banks, mess halls, etc. The railway was rapidly completed to Moose Creek, Matanuska Valley, via Matanuska Junction, and daily service began in August, 1916. In October 63 miles were operated, and 49 graded. It is planned to have 112 miles of the main line in service by May, 1917. Work was also commenced at the northern terminus, in the Tanana Valley, between Fairbanks and the mouth of the Nenana River, where the townsite of Nenana had been surveyed, and administration facilities organized.

Private capital has graded a railroad of 15 miles, between Katalla, Controller Bay, and a patented coal mine in the Bering River field. Its equipment and transportation of coal is promised for 1917. For the past few years the railroad on Seward Peninsula, from Shelton, has not been used. The Yakutat Southern refuses public business, but the other roads are being operated.

**WAGON-ROADS AND TRAILS.** Even more important than railroads is the net-work of ordinary roads and trails. The Alaskan Military Road Commission has spent on roads during 1916 \$300,762; \$165,000 from a special appropriation by Congress, and the balance from the Alaska Fund. The construction during the year of 21 miles of wagon-roads and of 50 miles of sled-roads brings the system up to an aggregate of 922 wagon-roads, 627 sled-roads, and 2210 trails, a total of 3759 miles. Repairs of fresh-damages, etc., make large inroads on the funds.

**FISHERIES.** The year 1916 was one of unprecedented prosperity in Alaskan fisheries. Although complete data are wanting, yet the shipments for 10 months ending with October show an increase of \$4,000,000 over any preceding year; the shipments aggregated, 1914, \$17,125,672; 1915, \$15,573,542; 1916, \$21,281,322. This increase was due in part to higher prices, but largely to the output, which as regards salmon—over 90 per cent of all—was larger by 47,455,000 pounds than in 1915. The latest complete data are for 1915, when the values, despite low prices, were \$20,999,343, distributed as follows: salmon, \$19,214,145; halibut, \$802,011; cod, \$300,199; whale, \$381,750; herring, \$155,579; miscellaneous, \$55,659. The capital invested was \$37,316,560, and the employees numbered 22,462. The halibut industry steadily increases, the values exceeding by \$14,300 those of the preceding year, besides large catches which do not appear in the Alaskan reports. The opening of the Grank Trunk Railroad to Prince Rupert, within 90 miles of Ketchikan, threatens some diversion of the American trade. In the cod fishery there were decreases in investment and in



product. The increase in herring values, \$432,000, was due to herring pickled for food. Only two whaling stations are operated, at Port Armstrong and at Akutan, which produced \$90,000 more than the year previous. Seventy-nine licenses were issued for commercial fishing, as required by law.

The salmon industry produces over 90 per cent of values. In 1915 there were 85 canneries, 45 in Southeastern, 17 in Central, and 23 in Western Alaska. The investment exceeds \$32,000,000 and the employees numbered 22,462. There was an enormous increase in the catch of humpbacks, or pinks, about 14,200,000, a decrease of 3,950,000 in red or sockeye salmon, and of 1,450,000 in chums or keta. While the catch of 1915 exceeded that of 1914 by 443,640 cases, of 48 pounds each, the 1916 product will probably exceed 1915 by 200,000 cases. There were great increases in the shipment of frozen salmon, and of fresh fish packed in ice. In order to conserve the salmon industries, the Secretary of Commerce limited from Jan. 1, 1916, fishing in: (1) the tributaries of Barnes Lake; (2) Hetta Creek and its tributaries; (3) Sockeye Creek and its tributaries and Boca de Quadra.

**FORESTS.** The receipts from sales of timber from the Chugach and Tongass National Forests in 1916 were \$60,232, and the expenses of administration, \$41,206. Under free-use permits the Alaskan Engineering Commission cut timber to the value amount of 11,629,500 board feet. There were 365 timber sales of 45,868,440 board feet. Applications were made for 72 homesteads in Tongass and 120 in Chugach forest during the year. Trails and roads are under construction, paid for by 10 per cent of the receipts from sales.

**EDUCATION.** There are three separate school systems in Alaska,—for the children of the incorporated towns, maintained locally; for white children in the rural districts; and for the Indians by the United States. (See *Natives*.) The schools in the 16 towns educate about 1700 children. In the unorganized districts there were maintained in 1916 37 rural schools in which there were 50 teachers and 1470 pupils, with terms of nine months as a rule. The rural schools are supported by an allotment of 25 per cent of the Alaska Fund, which is formed from business and trade licenses outside of incorporated towns. The efficiency of the rural schools is seriously impaired, as the population is increasing and the fund decreasing, the receipts for 1916 being \$260,256 against \$260,257 in 1915.

**MISCELLANEOUS.** The Council of the Yukon Territory by official resolution favored coöperative action by the governments of Canada, British Columbia, and the United States for the international protection of game, and for the extermination of wolves and coyotes.

**ALBANIA.** Nominally an independent country, comprising the former Turkish vilayets of Scutari and Janina and parts of Kosovo and Monastir. The independence of the country was proclaimed at Valona Nov. 28, 1912, and on December 20th the principle of Albanian autonomy was agreed to by the London Ambassadorial Conference. On Feb. 23, 1914, the German prince-ling, William of Wied, accepted from an Albanian deputation the headship of the government, and on March 13th, at Durazzo, formally became Prince (Mpret) of Albania. Turbulent

conditions followed the outbreak of the great war, and in September, 1914, the Prince left the country. (See *EPHROS*.)

The provisional frontiers of Albania embraced an area of about 10,800 square miles, with about 850,000 inhabitants. The majority of the population are Mohammedan. The town of Scutari has an estimated population of 35,000; Elbasan, 13,000; Argyrocastron (now in Greek territory), 12,000; Valona, 6500; Durazzo, the provisional capital, 5000.

**HISTORY.** Austrians invaded Albania from the north in January and the Bulgarians invaded it from the east. The former took Scutari by storm toward the end of January and forced the Italians to evacuate Durazzo a month later. The Bulgarians at the same time entered the central part of the country, took Elbasar in February, threatened Avlona held by Italians and Albanians, and possessed themselves of the entire central part. Prince William of Wied, former mpret (prince), who had left the throne in 1914, now returned and in a proclamation appealed to the loyalty of the people. Essad Pasha, the former provisional Governor, having failed in his efforts to check the Austro-Bulgarian invasion and joined the Italians, went to Paris in April, where he was received with honor. In the summer (July) Italians still held Avlona and the Greeks held a part of the south. Later (October 6th) it was reported that Essad Pasha was in command of an Allied contingent in Albania, and that the Committee of Union and Progress in session at Constantinople had pronounced sentence of death upon him. (See *WAR OF THE NATIONS*.)

**ALBERTA.** One of the Northwest Provinces of the Dominion of Canada, east of British Columbia and west of Saskatchewan. The capital is Edmonton. Area, 255,285 square miles, of which 2360 water. Between 1901 and 1911 the population increased 413.08 per cent, or from 73,022 to 374,663; the increase per cent was exceeded only in Saskatchewan. Subsequent to the 1911 census the population continued to advance rapidly, large numbers of persons being attracted by Alberta's grain-growing lands, of which there are vast areas. The city of Calgary had in 1911 43,704 inhabitants; Edmonton, 24,900; Lethbridge, 8050; Medicine Hat, 5608. Of the population 10 years of age and over in 1911, males numbered 179,062 (62.47 per cent) and females 107,576 (37.53); of these, 149,687 males and 11,923 females were reported as employed in gainful occupations. Of the males employed, 53 per cent were in agriculture, and of the females 46 per cent in domestic and personal service.

The provincial government is administered by a lieutenant-governor, appointed by the Governor-General of the Dominion; he acts through an executive council, or responsible ministry, of eight members. The Legislative Assembly consists of one chamber of 56 members elected by direct vote for five years. In the twelfth Parliament, which convened in 1911, Alberta was represented by four senators and seven members of the House of Commons; the representation in the Commons on the basis of the 1911 census is 12. The Lieutenant-Governor in 1916 was Robert George Brett. The Premier in 1916 was A. L. Sifton.

**ALBRIGHT ART GALLERY.** See *PAINTING AND SCULPTURE*.

**ALCOHOL.** By far the most ambitious and thorough investigation into the effects of moderate doses of alcohol on the human organism is that undertaken in the Nutrition Laboratory of the Carnegie Institution at Washington, an institution ideally equipped for such research work. The investigation as thus far reported deals with the psychologic aspects of the subject, and this feature, studied by Dodge and Benedict, comprises the effects of alcohol on the cerebrospinal system from the simplest reflexes of the lumbar portion of the spinal cord to the most complex arcs in the brain. The subjects of the experiments were either college graduates who used alcohol in great moderation or patients who had been under treatment for alcoholism. The normal base lines in all cases included two normal experimental days for each subject and for each kind of experiment. One normal day came before and one after the experimental days when alcohol was administered. In addition a normal of the day was recorded for each experimental process on the day when alcohol was given. Two standard doses of alcohol were adopted, one containing about 30 c.c., the other 45 c.c. of absolute alcohol. The fundamental fact was brought out that alcohol is not a stimulant, but rather a depressant to all reflex activities, from the simple muscle reflex to speech reactions and visual word stimuli. The most striking effects were found in the reflexes. The latent time was increased in all cases. Memory and the free associations were only slightly affected. Sensitiveness to faradic stimulation decreased 14 per cent, after alcohol. The number of finger movements decreased 9 per cent, and the velocity of the eye movement decreased 11 per cent, as a consequence of the ingestion of alcohol. The acceleration of the pulse, usually regarded as the effect of stimulation, may be explained by the depressive effect of alcohol on the inhibitory centre. These scientific conclusions prove the force of Quensel's statement that work and alcohol do not belong together, especially when the work demands alertness, attention, exactness, and endurance.

Kruepelin, of Munich, recently reported the results of a shooting tournament held in 1908 by the Bavarian Ministry of War to determine the influence of alcohol upon marksmanship. Twenty carefully selected marksmen fired 27,000 shots in 16 days during the test. A single small dose of alcohol was found to cause inaccuracy of aim 5 minutes later, the most pronounced effect being noted 25 to 30 minutes later. The average loss in accuracy was 3.1 per cent; but in 11 men it was as high as 9, 10, and 12 per cent. All men were in prime physical condition. In war time, under consequent deteriorating conditions, the loss of accuracy would be much greater.

**ALEICHEM, SCHOLEM.** A Yiddish humorist, died in New York City, May 13, 1916. His real name was Solomon Rabinowitz, but it was by his pen-name (signifying "Peace be with you") that he was known to millions of Yiddish-speaking Jews. He was born in Kief, Russia, in 1859, and there he lived most of his life, writing for Russian Yiddish papers. In 1906, because of oppressions of the Jews, he came to the United States, and he had been living here since the beginning of the European war. When war was declared he was staying at a German health resort. Scholem Aleichem's arrival in New York in 1914 was celebrated by his

co-religionists by great receptions in Cooper Union and Carnegie Hall. His funeral was the occasion of a still more remarkable demonstration, and it was estimated that 100,000 persons stood to watch the funeral procession pass. Among his own people Scholem Aleichem held a position corresponding perhaps to that of Mark Twain among the English-speaking people.

**ALEXANDER, MOSES.** Elected Democratic Governor of Idaho, Nov. 7, 1916.

**ALFALFA.** Although alfalfa is widely grown in many countries north and south of the equator and constitutes one of the world's principal hay and forage crops, statistics regarding its acreage and production have never been more than fragmentary and at present, owing to conditions incident to the European war, are either nonexistent or unavailable. In the United States alfalfa has continued to increase in popularity and in many States it is now grown in every county. It is estimated that about 25 per cent of the tame hay and nearly 20 per cent or all the hay, tame and wild, now produced in the United States is alfalfa, and on this basis the production of alfalfa hay in 1916 was approximately 23,000,000 tons of 2000 pounds each. According to statistics published by the Department of Agriculture the average farm price of alfalfa hay on Sept. 15, 1916, was \$10.06 per ton, as against \$8.22 on Sept. 15, 1915. The high price of grain in the fall of 1916 brought larger quantities of alfalfa hay into use as a substitute in feeding, as protein purchased in this form was cheaper than that bought in grain.

The commercial production of alfalfa seed in the United States is confined to the region west of the 100th meridian where irrigation and dry-land farming are practiced. Under humid conditions seed production does not prove satisfactory, and work on this subject by the Iowa Experiment Station showed that the proper functioning of alfalfa pollen, which is the limiting factor in seed production, does not take place when moisture conditions are above a certain point. The average yield of alfalfa seed in the United States is about 3.5 bushels per acre, although individual yields of 15 bushels per acre representing a value of \$108 have been reported. Owing to war conditions largely, only about one-half as much seed was imported into the United States in the fiscal year 1915-16 as in each of the three preceding years. The average price of seed received by farmers on Sept. 15, 1916, was \$9.27 per bushel and the average price paid by them was \$11.30.

The question of making alfalfa silage has received attention because when used by itself alfalfa fails to make a good and palatable product. The Nebraska Experiment Station has found that a mixture of two parts of alfalfa and one part of saccharine sorghum makes a highly desirable silage and the method is recommended for saving the last crop of alfalfa when it cannot be made into hay. The Kansas Experiment Station succeeded in making good silage of finely cut fresh alfalfa and rye in the proportions of two parts of alfalfa to one of rye. See also *U. S. Department of Agriculture Farmers' Bulletin No. 741, The Alfalfa Weevil and Methods of Controlling It, and No. 757, Commercial Varieties of Alfalfa* (Washington, 1916).

**ALGERIA.** A country of northern Africa, sometimes called a colony, actually an integral part of the French Republic. Capital, Algiers.

The total area of Algeria proper is 207,739 square kilometers (Algiers, 54,540; Constantine, 87,302; Oran, 65,897); of the Southern Territories, 367,550 square kilometers—a total of 575,289 square kilometers. Total population of Algeria proper (1911), 5,069,522 (Algiers, 1,720,881; Constantine, 2,118,446; Oran, 1,230,195); of the Southern Territories, 494,306—a total of 5,563,828, of whom 795,522 Europeans and 4,768,306 natives. In 1912 there were 6493 European and 35,424 native marriages, 22,557 and 140,894 births, 12,957 and 82,147 deaths.

The principal towns are: Algiers, with (1911) 172,397 inhabitants; Oran, 123,086; Constantine, 65,173; Bône, 42,039; Tlemçen, 39,874; Blidah, 35,461; Tizi-Ouzou, 31,404; Sidi-bel-Abbès, 30,942; Philippeville, 27,370; Sétif, 26,261; Mascara, 24,254; Mostaganem, 23,166.

**PRODUCTION.** Agriculture is the leading industry. The population returned as engaged in agricultural pursuits in 1909 was 3,322,640, of whom 213,750 Europeans. No later statistics for wine culture were available in 1916 than those given in 1915, which figures are therefore repeated. The area under vines in 1910 was 152,100 hectares, yielding 8,414,000 hectolitres of wine; cereals, 3,001,000 hectares, yielding 22,147,000 metric quintals; roots, legumes, etc., 59,300 hectares, 1,319,000 quintals; forage plants and sown grass, 26,000 hectares, 822,000 quintals. Natural grasses covered 851,000 hectares, the harvest being estimated at 3,871,000 quintals. Olive trees number 6,655,000, yielding 3,364,000 quintals of olives and 351,000 hectolitres of oil. In the table below will be found the areas devoted to principal cereal crops for two years, with the total yield and the average yield per hectare (preliminary figures) for 1914-1915:

	Hectares		Quintals	Qa.
	1913-1914	1914-15	1914-15	aa.
Wheat .....	1,863,084	1,298,633	9,341,472	7.3
Barley .....	1,267,932	1,094,005	8,679,835	7.9
Oats .....	231,714	288,770	2,189,172	9.2

Cultivation is carried on along the coast regions and on the plains, while the mountainous north is largely devoted to grazing.

**COMMERCE AND COMMUNICATIONS.** The table below shows the special trade for comparative years, in thousands of francs:

	1911	1912	1913	1914
Imports .....	571,500	655,100	667,500	518,200
Exports .....	509,600	519,800	510,500	333,800

Official returns for principal articles of export in 1913 are shown below, together with figures for 1915 from a British source; value in thousands of francs:

	1913	1915	1913	1915
Wine ..	220,850	181,265	Phosphates	11,590 4,970
Cereals ..	51,637	52,905	Olive oil ..	11,010 6,689
Animals ..	37,576	41,440	Vegetables ..	9,956 .....
Fruits ..	17,303	12,878	Skins .....	8,761 8,112
Barley ..	16,360	7,728	Exports .....	8,164 .....
Tobacco ..	15,668	18,340	Potatoes .....	7,551 .....
Iron ore ..	14,710	10,980	Flours .....	6,811 .....
Zinc .....	12,674	2,620	Veg. oil .....	6,258 .....

\* Sheep.

The principal countries of origin and destination are France (450,350 thousand francs imports and 343,550 thousand francs exports in

1913), Belgium (1675 and 14,250), Great Britain (20,625 and 24,000), Spain (15,500 and 10,075), Brazil (14,025 and 100), United States (12,975 and 3225), Germany (7450 and 13,650), etc. Vessels entered (1912 trade), 5375, of 6,589,265 tons. Railways in operation Dec. 31, 1913, including Tunisian railways, 6382 kilometers, of which 2902 kilometers state line; telegraph lines, 15,554 kilometers, wires, 40,624.

**FINANCE, ETC.** The budget for 1915 estimated the revenue at 170,103,318 francs and the expenditure at 170,035,526. For the Southern Territories revenue and expenditure were calculated at 5,060,522 and 5,029,423 francs, respectively. The debt stood Jan. 1, 1913, at 71,853,205 francs. A governor-general administers the country (M. Lutaud in 1916). German reports indicated a semi-religious uprising in Algeria under the leadership of Abdul Melik.

**ALLEGHENY (PA.).** See STRIKES.

**ALLEGHENY COLLEGE.** A co-educational institution at Meadville, Pa., founded in 1815. It is under Methodist Episcopal control, but is non-sectarian in policy. In the fall of 1916 there were in all departments 405 students. The faculty numbered 27. In productive funds the college had \$1,025,595 and from all sources it drew an income of \$174,791. The library contained 44,000 volumes. President, William Henry Crawford.

**ALLEN, FREDERICK M.** See DIABETES.

**ALLIANCE FRANÇAISE, FÉDÉRATION DE L'.** An association of societies in the United States and Canada, incorporated in 1902. It aims to promote the study of the French language, literature, arts, and history. A council which meets five times a year and which is composed of 20 directors, supervises the affairs of the Fédération. A circulating library is maintained. The honorary president of the Fédération is M. Jusserand, French ambassador at Washington. The president of the administrative council is M. J. LeRoy White. There are 50 groups or "circles" in different cities of the United States and Canada, and delegates are sent to an annual convention, the last convention being held in New York in April, 1916.

**ALLIED ECONOMIC CONFERENCE.** A meeting of the representatives of the Entente Allies for the consideration of economic and commercial questions held in Paris, April 20th. See GREAT BRITAIN AND FRANCE, paragraphs on *History*; *TARIFF*; *WAR OF THE NATIONS*.

**ALPENSYPHONIE.** See *MUSIC, Novelities*.

**ALSACE-LOBBINE.** For area and population, see GERMANY; see also *WAR OF THE NATIONS*.

**ALUMINUM AND BAUXITE.** The production of bauxite in the raw material from which the aluminum is obtained was in 1915 297,041 tons, valued at \$1,514,834, an increase of 77,723 long tons, or 35 per cent in quantity, and of \$444,640, or 42 per cent in value, as compared with 1914. The increase for 1915 was abnormal, and is accounted for by the increased activity in the production of metallic aluminum. The great bulk of the bauxite from which aluminum is produced comes from Arkansas, which in recent years has produced about 80 per cent of all the bauxite produced in the United States and in 1915 produced more than 90 per cent. Other States producing bauxite were Alabama, Georgia, and Tennessee. In the production of metallic

aluminum the United States leads all other countries. There were produced in 1915 99,806,000 pounds, compared with 19,129,000 pounds in 1914. There was exported in 1915 aluminum valued at \$3,682,117. The applications of metallic aluminum during the year in Europe have been many and the demand for it has been great. It is employed in the manufacture of cartridges, shells, helmets, grenades, and shell fuses. It is used also for camping equipment, and in the construction of air craft of all kinds. In the United States it is largely employed in the manufacture of automobiles, airships, and miscellaneous war supplies.

**ALUM MAKING PLANTS.** See WATER WORKS AND WATER PURIFICATION.

**AMERICAN AMBULANCE IN FRANCE.** See RELIEF FOR WAR VICTIMS, section so entitled.

**AMERICAN ASSOCIATIONS AND SOCIETIES.** For organizations, the official titles of which begin with the word AMERICAN, see under the specifically descriptive word in that title.

**AMES, WINTHROP.** See DRAMA.

**AMHERST COLLEGE.** A non-sectarian institution for the higher education of men, situated at Amherst, Mass. In 1916 it celebrated its 85th anniversary. Five hundred and five students were enrolled in the fall of 1916, and there were 53 members in the faculty. Within the year Walter W. Stewart of the University of Missouri was appointed professor of economics. Two hundred and fifty thousand dollars was presented by Mr. Edward C. Converse of New York City for a new library building as a memorial to Mr. Converse's brother, James B. Converse, class of 1867. The next largest gift was \$100,000, given by Mrs. Rufus Pratt Lincoln of Plainfield, N. J., to endow a professorship in science in memory of her son, Rufus Tyler Lincoln. At the 1916 commencement, the reunion classes added \$20,500 to the general alumni fund. Five thousand dollars for botanical work came to the college from the estate of Edward Tuckerman, and an equal sum was given by the Rev. George Atwater Hall, class of 1852, to establish a scholarship fund. The productive funds of the college amounted to \$3,000,000 in 1916 and the income to \$230,000. The library has 115,000 volumes. President, Alexander Meiklejohn.

**AMPHIBIA.** See ZOOLOGY, *Amphibia*.

**ANÆSTHESIA.** PARAVERTEBRAL ANÆSTHESIA. This method, which consists in injecting local anæsthetics of the cocaine type deeply into the tissues on either side of the spinal column, thus anæsthetizing the posterior spinal nerve roots, is extolled by Siegel of the gynecologic clinic at Freiburg. He believes it surpasses all other methods in ease of application and in efficiency. Out of 1000 cases the anæsthesia in 95 per cent was complete enough for the operation.

**ANALYSIS, QUALITATIVE AND QUANTITATIVE.** See CHEMISTRY, GENERAL.

**ANAPHYLAXIS.** This interesting and important phenomenon, closely related as it is to the problems of immunity, is receiving greater attention from experimental physiologists every year. The term designates a condition of exaggerated sensitiveness on the part of the animal organism toward foreign proteins, whether injected under the skin or received by way of the alimentary canal. Moschowitz summarizes the essential attributes of anaphylaxis as follows:

1. There is previous susceptibility, which may be congenital or acquired.
2. The reaction is specific.
3. The reaction can be obtained by mouth as well as by injection; also by cutaneous inoculation, such as rubbing into abraded surfaces.
4. Acquired susceptibility can be transferred by heredity to posterity.
5. The constitutional symptoms are respiratory disturbances, dyspnea, œdema, tonic muscular spasms, glandular swellings, joint effusions, albuminuria, and hyperæmic and urticarial skin eruptions.
6. All skin conditions thus far considered as anaphylactic are associated with eosinophilia, such as urticaria, eczema, prurigo, pemphigus, psoriasis, and pellagra.

Strickler and Goldberg of Philadelphia endeavored to ascertain the rôle of various animal and vegetable proteins as etiological factors in certain common skin diseases such as eczema, urticaria, psoriasis, and acne. They prepared extracts of beef, pork, mutton, fish, clams, lobster, wheat, oatmeal, rice, barley, strawberry, tomatoes, cow casein, and white of egg, injected these under the skin, and observed the reaction. Their results, while not conclusive, indicate that many sufferers from these skin affections are especially sensitive toward one or more proteins, and that elimination of these from the diet is often a ready means for curing the disease. Familiar examples of anaphylaxis are persons who are poisoned by eating strawberries, tomatoes, shell fish, and particular meats.

According to observations made at the Johns Hopkins University, patients free from eczema rarely react positively to the anaphylaxis tests. Of 43 patients without eczema only one exhibited evidence of hypersusceptibility, while out of 27 individuals suffering from eczema, 22 reacted positively to cutaneous and intracutaneous tests. White of egg, cow's milk, and women's milk were the substances found to cause a reaction most frequently.

**ANGELL, JAMES BURBILL.** An American educator and diplomat, died April 1, 1916, at Ann Arbor, Mich. He was born at Scituate, R. I., Jan. 7, 1829. After graduating at Brown University in 1849, he served as assistant librarian there and studied abroad for several years, returning to his Alma Mater as professor of modern languages and literatures (1853-60). While at Brown, he wrote much for the *Providence Journal*, and in 1860 he gave up teaching to become editor of this paper, a post he held till 1866, during the Civil War period. His first experience in university administration came during the five years that he served as president of the University of Vermont; his record there was such that in 1871 he was called to the University of Michigan. With this institution his name will always be identified. Its president for 38 years, at a time when the co-educational Western State universities rose from insignificance to a place, some of them, beside their long-established and privately endowed Eastern rivals, Dr. Angell was a leader in the formulation of policies which made the University of Michigan a model followed by other similar institutions. Ann Arbor had an enrollment of 1110 students in 1871; in 1909, when Dr. Angell resigned at the age of 80, becoming president emeritus and chancellor, it was four times as large. At various times, he was called upon to serve in diplomatic capacities. By appointment of President Hayes, he became Minister to China

in 1880, and was also chairman of a commission which negotiated two important treaties, one commercial, the other affecting immigration. After a year he resigned. In 1887 he served on the Anglo-American International Commission on Canadian Fisheries, and in 1896 was chairman of the Canadian-American Commission on Deep Waterways from the Lakes to the Sea. Again in 1897 he was sought out, this time by President McKinley, who appointed him Minister to Turkey. Dr. Angell accepted the post, but resigned within a year. He was a regent of the Smithsonian Institution, and held honorary degrees from many American universities and from Peking University, China. He published *Progress in International Law* (1875); *The Higher Education* (1899); *Reminiscences* (1912); *Selected Addresses* (1912).

**ANGLICAN CHURCH.** See ENGLAND, CHURCH OF.

**ANGOLA.** A Portuguese colony in western Africa with an estimated area of about 490,000 square miles, and a population estimated at 4,200,000. St. Paul de Loanda is the capital. The trade is mainly with Portugal. The colony is administered by a governor-general. See AGRICULTURAL EXPERIMENT STATIONS.

**ANILIN.** See OCCUPATIONAL DISEASES.

**ANNAM.** A French protectorate on the China Sea; a part of the dependency of French Indo-China (q.v.). Hué is the capital, with 65,000 inhabitants, and Bin-Dinh the largest town (75,000).

**ANNAPOLIS.** See UNITED STATES NAVAL ACADEMY.

**ANNAPOLIS AND BALTIMORE UNIVERSITY.** See MARYLAND, UNIVERSITY OF.

**ANNIVERSARIES.** See CELEBRATIONS; EXPOSITIONS; RUTGERS COLLEGE; YALE UNIVERSITY.

**ANTARCTIC EXPLORATION.** See POLAR RESEARCH, *Antarctic*.

**ANTHONY AMENDMENT.** See WOMAN SUFFRAGE, *United States*.

**ANTHONY MEMORIAL HALL.** See WOMAN SUFFRAGE, *United States*.

**ANTHRAX.** See VETERINARY MEDICINE.

**ANTHROPOLOGY.** The effects of the war are at last noticeable in the considerably diminished output of ethnological work. European journals, such as *Anthropos* appear irregularly or have temporarily suspended publication, and practically no monographic studies from abroad have been issued or at least hardly any have reached this country. In America, however, no change is perceptible either in point of publications or of newly undertaken research.

**ARCHAEOLOGY AND ETHNOGRAPHY.** *America.* Very marked progress has been made in the domain of archæology, especially in the perfection of a chronological technique and the application of statistical methods. By the study of potsherds found in visibly stratified and undisturbed refuse heaps N. C. Nelson was enabled to establish "Chronology of the Tano Ruins, New Mexico" (*American Anthropologist*, vol. xviii, pp. 159-180), which is of far-reaching importance for the whole of South-western archæology. He found that apart from the corrugated cooking-vessels and the soft, light "biscuit ware" that occur concomitantly with all other ceramic forms, there are five types of pottery from the earliest times to the historic period,—a local variety of the

black-on-white pottery being superseded successively by glazed pottery, pottery in which ornamental outlines are glazed but filled in with paint, degenerate glazed ware, and the modern painted pottery. While Nelson's work was stratigraphic, that of A. L. Kroeber, as outlined in *Zuñi Potsherds*, was restricted to surface finds. He was nevertheless able to distinguish two definitely marked periods,—the earlier one characterized by a predominance of white ware, while the later, embracing the historic era, shows a preponderance of black pottery. These periods were found capable of subdivision. Corrugated ware preponderates in the earliest of these sub-periods and diminishes throughout the entire span of time considered until its extinction in the present. With A. V. Kidder's sequence reported in the 1915 YEAR BOOK there are thus available three independent chronologies, for the Southwest, and their detailed correlation constitutes a problem for the immediate future. For an entirely different area the determination of a chronology has been attempted by E. W. Gifford in his *Composition of California Shellmounds*, where the age of two mounds is calculated from the total weight of shell or ash found in them, in conjunction with two hypothetical factors, the average population and the average consumption of shellfish by each individual. Gifford infers that the time of mound growth is from 3300-3700 years, thus confirming Nelson's results in the same region. Leslie Spier and Clark Wissler in their correlated papers describing "New Data on the Trenton Argillite Culture," and "The Application of Statistical Methods to the Data on the Trenton Argillite Culture" (*American Anthropologist*, vol. xviii, pp. 181-197) apply the mathematical methods hitherto restricted to physical anthropology to the archæological field. In this way Spier determines that the artifacts in question lie in groups forming a single plane in the upper part of the yellow loam and always with a characteristic vertical distribution, which seems to coincide with that of pebbles in the loam. Wissler argues from these facts and relevant data from elsewhere that the same causes of deposition acted on the artifacts from the several trenches and that the depositing agent at Trenton was geological, being presumably—contrary to current geological opinion—rather water than wind.

In ethnographical work the tendency towards an intensive study of technology is illustrated in Mary Lois Kissell's *Basketry of the Papago and Pima*. A similarly thoroughgoing investigation of a single subject in the economic field is given in F. W. Waugh's *Iroquois Foods and Food Preparation*, while C. M. Barbeau's *Huron and Wyandot Mythology* ranks as one of the most complete collections of folklore from the Eastern Woodlands. The *Twenty-ninth Annual Report of the Bureau of American Ethnology* is dedicated in its entirety to John P. Harrington's paper on "The Ethnogeography of the Tewa Indians," while M. C. Stevenson's "Ethnobotany of the Zuñi Indians" forms part of the *Thirtieth Report*. Data on Zuñi usages have been published by Elsie Clews Parsons (*American Anthropologist*, vol. xviii, pp. 245-256, 338-347). A hitherto practically unknown tribe of the Peace River country is described in P. E. Goddard's *The Beaver Indians*, which con-

sists largely of a collection of tales. The Beaver Indians are an Athapaskan-speaking people of typically Mackenzie area culture; in phonology they are most closely related to the Plains Indian Sarsi. Close contact with the formerly hostile Cree of the same general habitat has doubtless had some influence on their mode of life.

One of the most memorable contributions to the study of North American social organization has been made by E. W. Gifford in his *Miwok Moieties*. It derives special significance from the fact that it furnishes for the first time detailed data as to definite social groups in an area where such divisions were long supposed to be wholly lacking. The Miwok are divided into approximately, though not rigidly, exogamic moieties with paternal descent and named after the Water and Land. Each personal name has an implied or actual reference to an object associated with the moiety of the name-bearer, but since its significance is often purely symbolic it may be intelligible only to the immediate family and friends of an individual. Although the moieties are not, strictly speaking, totemic, the personal names most frequently associated with them refer to the bear and deer, respectively. The Miwok marriage regulations are of great interest. A man frequently married his maternal uncle's daughter, a form of "cross-cousin" marriage hitherto hardly ever reported from North America, though common in Oceania. Since it is not reflected in the kinship terminology at all, Gifford infers that cross-cousin marriage is a recent usage, derived through patrilineal inheritance of privilege from the coexistent custom of marriage with a wife's brother's daughter, which seems to have profoundly affected the terminology of relationship. Other types of matrimonial unions occur, such as that between a man and his brother's wife and with his wife's sister, and these also seem to have colored kinship nomenclature. In a complementary paper on *Dichotomous Social Organization in South Central California* Gifford traces the distribution of the moiety grouping with the result that this form of organization, which was believed to be wholly lacking in this part of America, is found to occur not only in the Miwok territory but also among several tribes of Yokuts stock and among a branch of the Shoshonean Mono, the latter having each moiety subdivided into two clans and non-exogamous. In all the tribes, the Miwok included, the dual divisions have reciprocal functions in funeral ceremonies and are pitted against each other in games. Traces of a possibly totemic division are reported from the Salinan to the southwest, and thus California can no longer be considered the region *par excellence* of a loose social organization. Somewhat farther to the north, among the Yahi and Upper Chinook, the relations of "Terms of Relationship and the Levirate" (*American Anthropologist*, vol. xviii, pp. 327-337) have been emphasized by E. Sapir, who suggests the marriage of a man with his brother's widow or his wife's sister as the reason for a classificatory nomenclature as an alternative for exogamy.

A simplified interpretation of the Aztec calendar system is attempted in T. T. Waterman's *The Delineation of the Day-Signs in the Aztec Manuscripts*. Waterman contends that the wide variation found is not due to historical

development but largely to conscious elaboration or abbreviation by individual artists. A problem of great theoretical interest is discussed in H. J. Spinden's "The Question of the Zodiac in America" (*American Anthropologist*, vol. xviii, pp. 55-80). Various writers, among them notably Mr. S. Hagar, having advanced the hypothesis that the classical zodiac was introduced into America from the Old World in pre-Columbian days, Spinden examines the evidence and arrives at a negative result. The question of the independent evolution of a conception akin to the zodiac is left open.

Perhaps the fullest data ever published on the religious and mythological conceptions of any South American aborigines have been furnished in "An Inquiry into the Animism and Folk-Lore of the Guiana Indians" by W. E. Roth (*Thirtieth Annual Report, Bureau of American Ethnology*, pp. 103-386). Dr. Roth shows that the Caribs, Arawaks, and other natives of this region did not have the conception of a Supreme Being but merely a belief in tribal heroes and a host of spirits inhabited the water, bush, sky, etc. The practice of the couvade, which attains its highwater mark here, is explained as due to the notion that a child is part and parcel of both parents and even at birth is not considered to have an independent existence. The medicineman plays an important part in tribal life. He was not merely a medical practitioner but also a dream-interpreter, prophet, depository of tribal lore, and the giver of personal names.

In *The Indians of Cuzco and the Apuromac* Prof. H. B. Ferris presents a study of the anthropometric material of the Quichua people collected by Dr. L. T. Wilson in connection with the Peruvian expedition of 1912 under the auspices of Yale University and the National Geographic Society. The Quichua are a people of low stature (1.58 m.) with unusually well-developed shoulders and thoraces, probably to be correlated with the carrying of burdens on mountain trails and breathing of rarefied air. The skin color varies from light brown to dark brown, and the hair is black, straight, and abundant on the scalp. In point of head form this tribe is mesocephalic, but verging on brachycephaly, the average index being 79.9, very nearly the same as for the Shoshoni and Chiriguan Indians. The face is broad and short, the lips are thick or medium, while the nose has a straight or wavy dorsum, a moderately prominent root and markedly divergent nostrils. In respect to physiognomic traits and body proportions the Quichua resemble North American tribes.

*Africa*. N. W. Thomas has published an *Anthropological Report on Sierra Leone* in three parts, devoted to general ethnography, lexicography, and grammar, respectively. The tribes dealt with are all of Sudanese stock, the Timne, Limba, and Bulem representing the subdivision with prefixing languages, while a second subdivision with prefixless tongues is formed by the Mandingo and Mendi. The culture of all these tribes is remarkably uniform, representing the West African type with its efflorescence of secret organizations and such socio-religious rites as circumcision and clitoridectomy. There are clans with paternal descent, though exogamy is on the wane, and while these divisions lack totemic names they observe distinc-

tive taboos. The clans are highly localized, being often restricted to definite territories and sometimes comprising the whole population of a village. Houses, except for intrusive rectangular forms, are everywhere of circular plan, with conical, thatched roofs. An anomaly is represented by the hitherto unexplained appearance of stone houses among the Limba of the Kaballa district. Pottery, which is of the coiled variety, is practiced mainly by the Mendi, while loom-weaving flourishes among the Susu, Mendi, and Limba. Native suspension bridges of creepers are used in crossing rivers, and the hammock has a general distribution throughout the protectorate.

Important new data on the Banyoro and Basoga, as well as on two Nilotic tribes, are published in John Roscoe's *The Northern Bantu*. Like the Baganda, the Banyoro represent the population of a very old Central African kingdom. Part of the people are entirely pastoral, while the remainder, apparently antedating the former in occupation of the country, are mainly agricultural. This cultural division accompanies a racial difference, the herders being of taller stature and more European physiognomy. The king was a powerful sovereign, the sole possessor of the soil, and ruler over a host of princes, chiefs, and sub-chiefs. As in some other parts of Africa, the king's mother also enjoyed the status of an independent potentate. The aristocracy of the realm is constituted by the pastoral group, the peasants form a caste of commoners, while those farmers who also own herds of cattle are of intermediate rank. This economic division is further reflected in the totemic organization. While all three castes are organized into exogamous totemic gentes, the names of the pastoral gentes are derived from cattle, those of the farmers' gentes from plants and agricultural objects, and those of the intermediate caste from both types of objects. The rule of exogamy is relaxed only in the case of royalty, even brother-sister marriages being permitted in the king's family.

The Basoga have always been tributary to surrounding nations. They are of Negroid physique and economically agricultural. A cult of the dead constitutes the most conspicuous of their religious practices, but fetichism likewise flourishes. An important group of rites, some of them connected with human sacrifice, have for their object the making of rain. Of the Nilotic tribes investigated by Roscoe the Bateso of Lake Kyoga are a peaceable people subsisting mainly on agricultural products, though cows, goats, and sheep are kept and hunting forms a secondary economic pursuit. There is a division into exogamic gentes with the peculiarity that several gentes bear the same name, but are distinguished by their totems. The Nilotic Kavirondo must not be confounded with their Bantu namesakes. They inhabit the territory extending southwards from Mt. Elgon along the coast of Lake Victoria Nyanza. Though settled in groups of villages among the Bantu they do not intermarry with them and remain distinct in language and custom. Millet and maize form the staple diet, but cows form the principal wealth of the people. Milk is used as an article of food and oxen are ridden. Both boys and girls pass through an initiation ceremony in which four front teeth of the lower

jaw are removed, the girls being subjected to an additional ordeal of scarification.

C. M. Firth has published the result of his archaeological researches, *The Archaeological Survey of Nubia*, and important conclusions of a general character are offered in E. A. Hooton's "Preliminary Remarks on the Archaeology and Physical Anthropology of Tenerife" (*American Anthropologist*, vol. xviii, pp. 358-365). The Guanches, i.e., the ancient natives of this and other Canarian Islands, have been regarded as relatives of the tall (1.78 + m.), long-headed, and broad-faced cave-dwellers of the upper paleolithic of France known as the Cro-Magnon race. Hooton finds that the Canary Islanders were of moderate stature (1.64 m.). The skulls are predominantly of Mediterranean form; a much larger long-headed type occurs, and there is also an intermediary type suggesting mixture of the two others. The craniological evidence for the Cro-Magnon theory is thus quite inadequate. Linguistically, the recorded Canarian material points to the Berber of the Atlas and the Kabyles. Culturally the Guanches were not representatives of a paleolithic culture. They were not hunters like the Cro-Magnon but goat-herds and barley-growers. They neither engraved on bone nor painted the walls of their caverns. If their stone technique remained on a low level, this was presumably for lack of suitable material. The ethnological affinities of the Canarians were probably not with any paleolithic race but with the Berber; the Islands were presumably colonized during the recent period by settlers from the African mainland who brought with them their domesticated animals.

*Oceania.* The first summary yet attempted of the mythology of the entire Indonesian, Oceanian, and Australian regions has been supplied by Roland B. Dixon in *The Mythology of All Races: Oceania* (vol. ix). Certain important results as to cultural relationships and migrations develop from this survey. Of the Polynesians, the Hawaiians and New Zealanders have preserved most of the original stock of mythology, while the other Islanders have absorbed considerable alien material in the course of subsequent migrations. The Hawaiians seem to have merely grazed the northern fringe of Melanesia, but reveal a close affinity with Indonesians and Micronesians. The Central Polynesians, on the other hand, have been largely affected by Melanesian contact. In Melanesia two distinct strata may be separated, corresponding to the racial divisions found,—an older Papuan mythology lacking cosmogonic features and emphasizing the belief in ghosts, and a later Melanesian stratum in which origin myths are better developed and a particular fondness for cannibalistic tales is displayed. Many parallels with Micronesian material occur, supporting independent anthropological evidence of affinity of these two regions, and the fact that Polynesian resemblances are confined to the eastern Melanesian archipelago confirms the hypothetical route of the Polynesians through that group rather than through New Guinea. Indonesian mythology is overlaid with Hinduistic and Islamic elements of relatively recent introduction, but when these intrusive factors are eliminated similarities with Melanesia, Micronesia, and Polynesia are unmistakable, and on general grounds an intimate re-

relationship with the wilder tribes of Southern China must be assumed. The basic mythological affinities of Australia remain obscure on account of our complete ignorance of the folklore of the extinct Tasmanians, but in the north-east elements of the other Oceanian mythologies crop up. Apart from the primitive Tasmanian and Negrito layers of which we remain ignorant, the characteristic Oceanian myths seem to have been spread by a series of waves coming from the Asiatic mainland through Indonesia, passing thence on the one hand to Micronesia and Hawaii and on the other through Southern Melanesia to Polynesia. The American analogies with Oceanian episodes remain mysterious anomalies.

**MEETINGS, EXPEDITIONS, PERSONALIA.** The American Anthropological Association (president, F. W. Hodge) and the American Folk-Lore Society (president, Robert H. Lowie) met at New York City, December 26th-29th, in conjunction with Section H of the American Association for the Advancement of Science.

The Bureau of American Ethnology supported archaeological work in the Southwest by Dr. J. W. Fewkes and linguistic investigations among Algonkian tribes by Dr. T. Michelson and in Oregon by Dr. L. J. Frachtenberg; ethnological researches were conducted by Miss F. Densmore on the music of the Mandan and Hidatsa, by Mr. F. La Flesche among the Osage, Mr. J. Mooney among the Cherokee, and Mr. J. N. B. Hewitt among the Iroquois of Ontario and New York. Dr. Walter Hough of the U. S. National Museum, after returning from the reinstallation of the San Francisco government exhibit at the San Diego exposition, conducted archaeological and ethnological research in western New Mexico and northern Arizona. Dr. W. E. Roth made an ethnological collection of British Guiana material for the Smithsonian Institution. Under the auspices of the Carnegie Institution Mr. S. G. Morley visited the ruins of Quirigua and Copan, where he was met by Prof. W. H. Holmes of the U. S. National Museum. The American Museum of Natural History financed both archaeological and ethnological work in the Southwest: Mr. N. C. Nelson continued excavation in the Galisteo region, Mr. E. H. Morris examined the Aztec and the San Juan drainage ruins, while stratigraphic work at Zufii was allotted to Mr. L. Spier; Professor Kroeber at Zufii, Dr. P. E. Goddard among the White Mountain Apache, and Dr. R. H. Lowie among the Hopi devoted themselves to the study of social organization and ceremonialism. Under the same auspices Mr. G. L. Wilson visited the Mandan and Hidatsa, while Dr. H. J. Spinden visited Venezuela and later Porto Rico for archaeological research. Mr. C. W. Bishop returned to the University of Pennsylvania after an exploration of the Chinese province of Szechuan. The Museum of the American Indian, Heye Foundation, financed archaeological work by Messrs. M. H. Harrington and A. B. Skinner in Arkansas, and by Messrs. Skinner and W. Moorehead in Pennsylvania and New York; Mr. T. De Booy resumed his survey of the Antilles and Central America. The Peabody Museum dispatched Mr. A. Carpenter for an exploring trip to Guatemala. Under the auspices of the University of California Mr. L. Outhwaite made an archaeological survey of the Santa Barbara archipelago and Dr. J. A.

Mason studied the Salinan language; with the aid of a joint grant from this institution and the New York Academy of Sciences Mr. E. W. Gifford collected data on California kinship systems. The Geological Survey of Canada dispatched Mr. C. M. Barbeau to collect folk-songs and tales among the French Canadians of the lower St. Lawrence region, while Mr. F. W. Waugh investigated the technology of the Ojibwa and Mr. D. Jenness continued his ethnological work as a member of the Stefánsson expedition. Under the same auspices a visit to Ottawa of Indian chiefs from British Columbia was used for somatological measurements and ethnological investigation by members of the staff.

Physical anthropology sustained a severe loss through the death of Prof. Hermann Klaatsch, prominently identified with the study of evolutionary problems, and folklorists mourn the demise of Sir Laurence Gomme, one of the most active British investigators of mythology and kindred fields.

**PHYSICAL ANTHROPOLOGY AND THE ANTIQUITY OF MAN.** This tendency to study the racial types of European nations continues to be stimulated by the political situation. L. Bartucz, in a paper on "The Stature of the Modern Magyars," finds that the average height of Hungarian men is between 167 and 168 cm., the mean stature of the women approximating 154 cm. A very considerable regional variation is noteworthy, suggesting mixture with different racial types. The maximum height is attained at the age of 29; it descends gradually in the thirties and very rapidly after 60. In this connection may be mentioned a paper by Emil Fischer on "The Proportion of Slavic Elements in Rumanian" (*Korrespondenz-Blatt*, xlvii, p. 56 *et seq.*), for while using primarily linguistic data this author's object is to prove that the Rumanians of to-day are not a pure Latin stock but represent a mixture of Latin and Slavic elements. The language is a mixture of Thracio-Romance and Slavic, while somatological traits, such as pronounced short-leggedness, brachycephaly, dark hair, and fecundity, point to an infusion of Slavic blood. The problem of the racial affinities of the primitive Slavs is attacked by K. F. Wolff (*Mannus*, viii, 35 *et seq.*), who arrives at the conclusion that the "Altslaven" were North Europeans and more particularly East Germans who adopted a Slavic tongue from Little Russian and other sources and acquired secondary somatological traits by mixture with alien stocks. Notes on the Montenegrins are furnished by Pittard (*Revue anthropologique*, 1916, p. 198 *et seq.*), who finds them to be typical representatives of the tall, short-headed Dinaric race. Unfortunately the pages of the *Revue* are now largely occupied with vituperative characterizations of the Germans which transgress all bounds of decency and taste. Thus, M. Capitan proves to his satisfaction that the Germans are criminal lunatics (p. 79) emitting offensive odors in the most literal sense of the term. The German counterblast to this species of anthropological war literature is to be found in Professor Kossinna's *Mannus* (vii, pp. 187-190), where the French are described as a nation of degenerates who will surely meet with condign punishment.

Other continents have not been wholly neglected. In *L'Anthropologie* (xxvii, pp. 47-95,



211-242), M. Verneau summarizes M. de Gironcourt's West African observations, according to which the Tuareg of the caste of noblemen are both markedly dolichocephalic and of very tall stature (175 cm.). A monograph on Peruvian skeletal finds has been published by George F. Eaton under the title of "The Collection of Osteological Material from Machu Picchu" (*Mem. Conn. Academy of Arts and Sciences*, vol. v). Dr. A. Hrdlička's study of "Physical Anthropology of the Lenape or Delawares, and of the Eastern Indians in General" (*Bureau of American Ethnology*, Bulletin 62) shows that the Iroquois, while linguistically distinct from surrounding Algonquins, show no somatological individuality as compared with these alien neighbors. Physically, the stocks are identical. All Eastern crania belong to the same type, characterized by marked to moderate long-headedness in males and by moderate dolichocephaly to mesocephaly in females. This type is akin to that of the Shoshoneans in the West, the Piman-Aztec in the South, and the Andean type of South America. Where suggestions of brachycephaly appear, Dr. Hrdlička traces them to admixtures of probably recent origin. Among descriptive contributions must be mentioned E. W. Hawkes' "Skeletal Measurements and Observations of the Point Barrow Eskimo" (*Amer. Anthropologist*, 1916, pp. 203-244). The results of racial mixture have been investigated by A. E. Jenks in his *Indian-White Amalgamation, an Anthropometric Study*.

Views bearing directly on anthropological problems are advanced in William K. Gregory's paleontological *Studies on the Evolution of the Primates*. From comparative anatomical and embryological data this student infers that man and the anthropoids have been derived from a primitive anthropoid stock, man's nearest living relatives being the chimpanzee and gorilla. While with these, however, ancestral habits and character of brain, dentition, skull, and limbs have persisted with only subordinate changes, the forerunners of the Hominidae underwent a profound change in function, giving up arboreal frugivorous adjustments and becoming at an early period terrestrial, bipedal, and predatory, with the development of crude flints for cutting up and smashing the varied food. The ancestral stock from which man, the gorilla, and the chimpanzee have sprung is represented by two Upper Miocene genera—*Sivapithecus* and *Dryopithecus*—of which the former is more directly the ancestor to the Hominidae. Man differs from the *Sivapithecus* largely in the way of retrogressive changes due to the alteration of his food habits. In this connection Gregory cites the retraction of the face and dental arch, the reduction of the canines and of the jaw muscles, as well as the loss of the prehensile character of the hallux. Other differences are secondary adjustments in relative proportions, connected with the change from semi-arboreal to fully terrestrial bipedal locomotion. The Hominidae probably branched off from the Simiidae not earlier than the Miocene or even Upper Miocene. *Homo heidelbergensis* seems to be the direct ancestor of all later Hominidae.

**GENERAL ETHNOLOGY.** Though the detention of Graebner as a military prisoner on Australian soil renders the discussion of his theoretical views a somewhat one-sided affair, the reverberations of the hubbub created by his theories of

diffusion and cultural strata are still audible. In a dissertation on "The Idea of Fertilization in the Culture of the Pueblo Indians" (*American Anthropological Association, Memoirs*, iii, pp. 1-55), H. K. Haeberlin attacks more particularly the complete neglect of psychological factors practiced by Graebner and his followers. This is done with special reference to the concrete facts of Pueblo culture. The Navajo and Hopi share many ceremonial features, the presence of which is intelligible only by borrowing. But this conclusion, which exhausts the phenomenon from Graebner's point of view, is in reality of very limited significance. For the same objects which the Navajo employ to cure the sick are used by the Hopi to produce rain. An analysis of Hopi ceremonialism reveals the predominance of this idea of fertilization, which really forms the distinctive trait of Pueblo culture as distinguished from that of other regions. This setting entirely eludes a Graebnerian analysis, which looks on a culture as the mere summation of cultural objective atoms. Since the importance of this cultural atmosphere cannot be doubted, the purely external point of view is thus reduced to an absurdity.

If Graebner himself is unable to take up cudgels on behalf of an unlimited tendency to diffusion, English protagonists of the theory have arisen for whom the boundaries of time and space no longer exist. Foremost among recent converts is Prof. Elliot Smith, who interprets an elaborately carved Central American idol as the undoubted representation of the elephant of India, made, however, not after nature but copied from an earlier model presumably made by an Asiatic immigrant. This position is obviously of tremendous importance since the indigenous or derived character of pre-Columbian civilization in Central America is linked with the problem here broached. Elliot Smith flouts the theory of Maudslay that the proboscidean might represent the indigenous tapir, as well as Seler's hypothesis that the carving suggests tortoise heads. Arguing against Smith on the basis of the Maya style of realistic representation, Drs. Tozzer and Spinden have independently reasserted the approved American view that the animal in question is a blue macaw. In a spirited rejoinder Elliot Smith protests against the ethnological "Monroe doctrine" which vindicates an exclusively aboriginal origin for the native American cultures and supports his argument by a comparison of the folklore gathered round the rain-gods of India and Mexico. More specifically, much of the ancient Indian pantheon centred round the god Indra is alleged to have been bodily adopted by the Maya. Smith assumes that the process of diffusion began about 200 B.C. and continued for a long period, the several cultural elements being brought in by small bands of immigrants whose higher status of civilization enabled them to effect an influence on the cruder autochthonous population quite disproportionate to the number of the transmitting groups. In this way practically every element of the early civilizations of America is said to have been borrowed from the Old World,—a truly astounding conclusion for the professional Americanist. (For the entire discussion, see *Nature*, xcvi, pp. 340 f., 425, 501, 592-594, 612.)

In another paper on "The Origin of the Pre-Columbian Civilization of America" (*Science*,

1916, pp. 190-195), Elliot Smith with, if possible, greater vigor than ever attacks the idea of an independent evolution of American culture. According to this latest pronouncement, the period of the New Empire in Egypt witnessed a combination of bizarre and disparate practices, some of them of older standing, and in this new form the chance association of cultural traits began to spread some time after 900 B.C. from Egypt to the eastern regions, until with various Ethiopian, Mediterranean, West Asiatic, Indian, Indonesian, East Asiatic, and Polynesian modifications and additions it reached America. The doctrine of independent development is repudiated on the ground that the traits in question are far too numerous and specific and their association purely fortuitous, so that psychic unity as an explanatory factor seems out of the question. In reply to Smith, A. A. Goldenweiser (*Science*, 1916, pp. 531-533) vindicates the claims of the theory of independent evolution wherever diffusion has not been definitely proved. Philip A. Means (*ibid.*, p. 533 f.) urges against the Egyptian origin of American culture the absence of the wheel in aboriginal America, and the low development of Central and South American navigation. He also regards the period of time suggested by Elliot Smith for the process of transmission as entirely too short, proposing as a substitute 1500 B.C. as the approximate date at which the cultural wave might have begun to roll from Egypt toward the New World.

The discussions of the position of ethnology with reference to other branches of learning are being vigorously continued. Two authors have independently advocated the definition of ethnology as a purely historical science, as voiced by Kroeber in his "Eighteen Professions" (see YEAB BOOK for 1915). In his address on "Psychology and Ethnology" (*Folk-Lore*, xxvi, pp. 115-137), A. M. Hocart argues that the ethnologist's business is to determine the series of social changes by historical research. Psychology is of no use for ethnological problems because of the psychic unity of mankind. Our subject-matter is the "ever changing and endless variety of custom and belief," and this cannot be deduced from a psychic constant. The psychological interpretation is irrelevant because of its generic character where the demand is for a specific account. Similarly C. Wissler in his "Psychological and Historical Interpretations for Culture" (*Science*, xliii, pp. 193-201), finds that all attempts to explain particular cultural traits as due to psychic unity have been abortive and that the reason for the development or association of certain ideas can be ascertained only historically, while the most minute description in psychological terms would be futile. Psychology can be of use to ethnology only by defining what human activities are due to innate equipment and which are the result of nurture, as opposed to nature. A vigorous rejoinder to Kroeber's "Eighteen Professions" has been published by H. K. Haeberlin (*American Anthropologist*, 1915, pp. 756-759), who protests against the rigid exclusion of psychology from the ethnological sphere; as the science of all mental phenomena, he contends, psychology is the ideal link for uniting the natural and the mental branches of knowledge.

A suggestive contribution to the psychology of scientific thinking is made by Kroeber in his

"Inheritance by Magic" (*American Anthropologist*, 1916, pp. 19-40). He begins with the hesitancy of biologists to relinquish the notion of the inheritance of acquired characteristics. This attitude, he holds, is the result of a naive confusion of biological with ethnological modes of thought. All of us note the "use inheritance" or transmission of traditional culture elements; the biologists in question are merely transferring, by a false analogy, a fact of social science to the domain of organic processes. It is merely necessary to recognize the source of their error, and the belief in Lamarckian factors will be swept away.

Among the synthetic works of large scope that were launched during 1916 may be mentioned *The Mythology of All Races*, edited by Louis H. Gray and published by the Marshall Jones Co. of Boston. This is intended to comprise thirteen volumes, of which two (i, "Greek and Roman" by William Sherwood Fox, and x, "North American" by Hartley Burr Alexander) have been published during the current year.

#### ANTI-SALOON LEAGUE OF AMERICA.

Largely as a result of the work of the League, State-wide prohibition of the liquor traffic was adopted in four States, Montana, Nebraska, South Dakota, and Michigan, at the general election held on Nov. 7, 1916. This makes a total of 23 States that have taken such action. Two other States, Utah and Florida, elected Legislatures pledged to enact State-wide prohibitory laws. At the end of the year 89 per cent of the land area of the United States, embracing 59 per cent of the population, was legally "dry," and when the new laws in the four States named, together with the Territory of Alaska, go into effect, these percentages will be largely increased. While the Anti-Saloon League works for prohibition, whether by State-wide measures or local option, its great objective is national prohibition, to be secured through an amendment to the Constitution of the United States. Before the end of 1916 both the House and the Senate Judiciary Committees had voted to recommend passage of the bill drafted by the League. The Postoffice Committee had voted to recommend passage of a bill to bar liquor advertising from the United States mails, and a Senate vote in January had been promised on a bill for prohibition in the District of Columbia. The officers of the League for 1917 are as follows: President, Bishop Luther B. Wilson; general superintendent, Rev. P. A. Baker, Westerville, Ohio; secretary, Rev. S. E. Nicholson; treasurer, Foster Copeland.

**ANZAC.** A name that came into prominence during the War of the Nations as indicating the Colonial troops of Great Britain. It was composed of the initials of the more important British Colonial possessions, namely, Australia, New Zealand, Africa, and Canada.

**APARTMENT HOUSES.** See ARCHITECTURE.

**APPLES.** See HORTICULTURE.

**AQUEDUCT.** NEW YORK: The development of a 250,000,000 gallons per day addition to the Catskill water supply system of the city of New York was authorized during the year and funds were made available for utilizing the Schoharie watershed. This involves the building at Gilboa of a large dam, probably between 200 and 300 feet high, to impound the water from the Scho-

harie drainage area, amounting to 314 sq. miles, and the construction of a tunnel 18 miles long to convey the water to the Ashokan Reservoir of the present system. The estimated cost of this addition was \$22,000,000 and the construction of the dam and tunnel were to require about eight years. The tunnel was to be about 11 feet in diameter and was to be driven from eight shafts ranging in depth from 100 to 640 and distant from each other about 10,400 to 14,200 feet. It was to pass through one of the main ranges of the Catskill Mountains extending from a point on Schcharie Creek below the dam site at Gilboa to Aesopus Creek near Shandaken. The tunnel was to be at hydraulic gradient with a slope of about 4 feet per mile and have a concrete lining with a minimum thickness of 12 inches.

At the end of the year the completion of the Catakil Aqueduct was virtually consummated, and Mayor Mitchel of New York appointed a committee to arrange to formally celebrate this event in 1917. The twelfth anniversary of the appointment by Mayor McClellan of the three commissioners of the Board of Water Supply would occur in June, 1917, at which time would also occur the 75th anniversary of the turning of Croton Water into the city of New York.

LOS ANGELES. During 1916 surplus water from the Los Angeles Aqueduct amounting to 125 second feet was being furnished to the San Fernando Valley. Of this amount 100 second feet was being used for the irrigation of 20,000 to 30,000 acres and the remainder for domestic purposes. The irrigation supply first utilized in May, 1915, was being developed so that eventually 87,300 acres would be irrigated by aqueduct water. While a single distribution system had been planned political conditions required two geographical divisions. The San Fernando irrigation district No. 3 with 76,090 acres was formed in 1914 and in the following year voted \$2,606,000 bonds so that actual construction was begun in 1916. The other division known as the Mission District with an area of 11,215 acres completed its organization and voted bonds for construction work. The general scheme of development provided for serving the irrigated area by trunk lines ranging from 54 to 30 inches in diameter. It was estimated that 1 inch of water, continuous flow, would be required for every 7½ acres within the district. That is the equivalent of 1 inch to 5 acres for an irrigation season of 240 days. When the district is fully served it will use surplus water to the extent of more than 11,000 inches, giving Los Angeles an approximate revenue of \$250,000 a year. The annual sales in 1916 totaled approximately \$100,000.

Contracts amounting to approximately \$559,755 for pipe and materials were awarded and were followed by contracts for additional pipe. The advanced methods followed in the construction of the aqueduct proper were also seen in this work. To July 1st approximately 25 miles of trunk lines and laterals had been constructed and placed in operation.

The pipe was hauled to the valley and distributed along the ditches by auto trucks. Steam shovels excavated the main trenches, while smaller laterals were dug by power excavators and a power-driven machine was used for back-filling. Thus practically the entire work is done without hand labor.

It was estimated that the total cost of completing the system would be \$4,354,895.

WINNIPEG. In the construction of the Winnipeg aqueduct described in the 1915 YEAR BOOK an important feature of the year 1916 was the cracking of considerable portions of the concrete structure. Out of 65,390 feet of aqueduct completed in 1915 cracks developed in the invert of about 14,380 feet. Usually there was a single crack along the middle, but in a few of the badly cracked sections there were also cracks in the side walls of the arch. A board of engineers investigated the matter and found that the cracks were due to the settlement of the aqueduct where it was founded on compressible soil. Repairs were undertaken by cutting out the crack to a depth of 1½ to 2 inches and to a width of about 1 inch. This was packed with neat cement slightly moistened and hammered into place with a calking tool. Tests showed that the joint was of considerable strength and breaks were more likely to occur in the old concrete. For new construction the board recommended that in firm soil the base of the invert should be extended on both sides to a length of 8 inches beyond the sidewall and that in compressible soils the inverts should be heavily reinforced. This was done and in the construction of 1916 no settlement cracks developed. Modifications in the plans in the interest of economy may be possible, but a revised estimate for the entire project taking into consideration the changes found necessary amounted to \$6,867,700, as compared with the original estimate of cost of \$7,097,640.

MONTREAL. A voluntary commission of seven prominent Canadian engineers, of which W. S. Tye was chairman, submitted a report on November 20th to the city authorities of Montreal on the water-power project which has been under construction for several years in connection with the city's water-supply. This involved the enlargement of the open canal originally used to divert water from the St. Lawrence River for municipal purposes. In 1909 a closed reinforced concrete conduit was built along the route of the canal and while this was adequate for the city's water supply, the power project was advanced so as to reduce the cost of pumping and afford power for various municipal purposes. The commission found that the final cost of the water power project would be at least \$10,600,000, and that not over 7000 horse power could be developed. The minimum fixed charges and operating expenses of the power plant would be \$108 per horse power per annum, while the city could purchase power in the open market from some of the hydroelectric plants in the vicinity of Montreal for not more than \$20 to \$25 per horse power per annum.

The commission urged that the city should abandon the present project, on which it had already expended over \$5,000,000, and estimated that by so doing it could save \$262,000 per annum by purchasing power compared with the cost of completing the present project. This elaborate project, it was alleged, originally was undertaken by the municipal government without adequate and competent engineering advice.

See WATER-WORKS AND WATER PURIFICATION. **ARBITRATION, INTERNATIONAL.** See INTERNATIONAL PEACE AND ARBITRATION.

**ARBITRATION AND CONCILIATION, INDUSTRIAL.** As in preceding years, 1916 brought an increase in the sentiment in the

United States favoring the application of methods of arbitration and conciliation in preference to strikes and lockouts and other displays of force in the settlement of industrial differences. Street railway strikes in New York, Washington, and elsewhere, and especially the threatened strike of the great Railroad Brotherhoods in the late summer, brought sharply before the public the question of the advisability of compulsory arbitration in industries intimately connected with the general welfare of cities or of the country. Another tendency of recent years was illustrated by the renewal of various trade agreements and by the reestablishment, after a bitter strike, of the protocol in various branches of the clothing industries in New York. A few of the important controversies and their settlements are described below. For others, see STRIKES AND LOCKOUTS.

**CLOAK AND SUIT INDUSTRY OF NEW YORK.** For six years controversies between employer and employee, in this industry, have been settled by means of the famous protocol devised by Louis Brandeis and others and accepted by the Manufacturers' Association in 1910. This was a progressive instrument in arbitration and though not used always with success had at least contributed much toward keeping peace. In May, 1915, relations of protocol were declared severed by the Manufacturers' Association, but early in July both sides agreed to submit differences to a Council of Conciliation appointed by Mayor Mitchel. The old board of arbitration not being reestablished the Council with tacit consent of both association and union assumed its duties. On March 1, 1916, the Council made the decision that a union man eligible for employment under terms of the "preferential union shop" clause of the agreement should be one of good standing with union dues paid up. But March 3rd, the Cloak, Suit, and Skirt Manufacturers' Protective Association not only notified the Council of Conciliation that it would not accept the recommendation "because it created new legislation," but refused to send representatives to a conference which the Council had called. The various locals of the International Ladies' Garment Workers' Union replied by saying they were unable to deal longer with the Association. With no means for settlement of the controversy a general strike among workers of the industry was then imminent. In order to avert it, Mayor Mitchel called a conference to which were invited E. J. Wile, president of the Association, Benjamin Schlesinger, president of the Union, members of the Council of Conciliation and several representative citizens, Jacob H. Schiff, Oscar S. Straus, W. C. Breed, and Dr. Henry Moskowitz. The Manufacturers' Association refused to attend this, the result of an attitude due chiefly to a small reactionary faction. But the Association held a secret session during which it decided to close its shops and fight the Union, defending itself with the plea that the controversy was over the old principle of open and closed shop and that the open shop was necessary to the success of the business. J. H. Schiff and Oscar Straus then made a further attempt to avert a lockout by inviting the 409 members of the Manufacturers' Association to discuss various means of settlement in a private conference. But only 30 of the members attended and no decision was reached.

Meanwhile a parade and demonstration on May Day by the strikers further complicated the situation. Three hundred and fifty of the 1800 independent clothing manufacturers and three of the 409 members of the Manufacturers' Association then made individual settlements with the strikers, with the result that several thousand of the 60,000 strikers returned to work, agreeing to devote a certain per cent of their wages to the Union. All manufacturers asking individual settlements were expelled by the Association.

The stock and shipping clerks in the cloak, suit, and skirt factories then joined the Union, increasing the number of strikers. However, C. L. Bernheimer, chairman of the Arbitration Committee of the Chamber of Commerce, averted a strike in the men's clothing industry by successful arbitration. Workers in the industry in factories outside of New York City were called to join the strikers, and by May 11th the strike had spread to Chicago, Vineland, N. J., and Stamford, Conn. The Union further crippled the Manufacturers' Protective Association by prohibiting the Merchants' Society of Ladies' Tailors from selling styles to members of the Association.

Throughout the controversy with one exception the Manufacturers' Association had refused to confer with any one, and hence it was held responsible for conditions not only by the Union but by citizens and economists as well. But the crisis in the strike came June 1st when the employers of the Manufacturers' Association threw open their doors to "open shops" and invited the Union to return but on the employers' terms entirely: the workers refused to go back since no concession had been made them.

The Mutual Cloak, Suit, and Skirt Manufacturers' Association now offered to let Mayor Mitchel arbitrate the strike, but the Union, fearing this a ruse on the part of the Protective Association, refused. Finally, however, the strike was terminated August 4th, and a new agreement was then signed by representatives of the Cloak, Suit, and Skirt Manufacturers' Protective Association, of the International Ladies' Garment Workers' Union, and of the Joint Board of Cloak Makers Unions of New York City. The following is a summary of the main points of the new agreement: 1. Preferential union shop for worker proving union membership. 2. Forty-nine hours in week's work of six days. 3. No overtime work in manufacture of cloaks and suits between November 15th and February 1st nor between April 15th and August 15th. Manufacturers of special lines shall have right to establish periods different from these according to demands of business. But overtime shall not exceed 10 hours a week nor 2½ hours a day and shall be restricted to first five working days of the week. Additional overtime shall not be permitted save in cases of emergency and then only with consent of union, with double pay for overtime for week workers. 4. Minimum wages were increased. All piece rates to be settled between employer and price committee of shop. 5. No time contracts except with foremen, designers, and pattern graders. 6. No strike to be called by union nor lockout by employers until after 24 hours' notice. 7. Agreement shall continue three years from date of execution.

**THREATENED RAILROAD STRIKE.** One of the most notable instances of attempted arbitration

in the United States was that of the conference of railroad men in New York City in August. This conference was held between 25 men representing 225 railroads with \$20,000,000,000 of capital and five men representing the four great railroad brotherhoods, Locomotive Engineers, Enginemen and Firemen, Railroad Conductors, and Railroad Trainmen. Chairmen of the conference committees of these brotherhoods to the number of 600 from all over the United States were also present.

The discussions of the meeting dealt with hours, wages, schedules, and overtime pay. The employees demanded an eight-hour day with one and one-half pay for overtime, the demand applying only to the freight service. In making this demand, brotherhoods cited 78,940 cases where the working day had been in excess of the maximum number of 16 hours permitted by Federal law. In reply employers asserted that if the demand were granted \$75,000,000 to \$100,000,000 would be added to the annual payroll, and hence as most railroads pay low dividends, it would necessitate an increase in freight rates. Moreover, this increase in salaries would affect only 18 per cent of the employees and as those affected were already the highest paid men, such an increase would be unfair to the other 82 per cent. The employees then attacked the validity of wage figures offered by the companies, saying they were able to earn a reasonable income only by working excess hours.

After several days of discussion, the contending parties were unable to arrive at an agreement. Negotiations before the Federal mediators were then taken up, but ended in a deadlock, both parties refusing to arbitrate. By a referendum vote of the unions previously taken 95 per cent of the total membership had authorized a strike, and the whole country faced the calamity of famine and a general tie-up of business. When matters were at such a crisis, President Wilson called both sides to the White House for a conference, and for a week devoted his entire time to adjusting the issues. Finally the President proposed that the railroads should concede the eight-hour day with straight time payment for overtime, and that the unions' demand for one and one-half times pay for overtime and the railroads' demand for elimination of double pay should be held in abeyance while the eight-hour experiment was being made. This done, the President promised to secure authority from Congress to appoint a committee to investigate and report on the situation, either side being free then "to give notice of a termination of the present agreements with a view to instituting inquiry into suggested readjustments of pay or practice." This plan was approved by the chiefs of the four brotherhoods and formally accepted by the committee of 600 minor union officials to whom power of settlement had been given. But it was unanimously rejected by the managers' committee and 33 railroad presidents on the claim that they were contending for the principle of arbitration.

On August 29th, when it was evident that the railroad presidents had no new measures to propose, and when 600 chairmen of the brotherhoods had gone home with orders for a strike to become effective September 4th, President Wilson addressed a joint session of the two Houses of Congress. He asked for the adoption of six measures essential for handling the situation

and also for protecting the interests of the country in future controversies of a similar nature. Briefly these measures were: 1. Enlargement of the Interstate Commerce Commission. 2. An eight-hour law for employees engaged in operation of trains. 3. The creation of a commission to study the effect of the eight-hour day. 4. An expression of "explicit approval by Congress of the consideration by the Interstate Commerce Commission of an increase in freight rates" if facts justify it. 5. The adoption of a law similar to the Canadian Industrial Disputes Act which would make railway strikes unlawful pending the outcome of a government inquiry. 6. A measure giving the President power to operate the railroads and draft employees into service if military necessity should require it.

In stating his reasons for legislating on the matter, the President mentioned that the men refused to arbitrate, the railroads would make no concessions, and a strike which would bring calamity to the whole country was imminent. Also, he contended, the spirit of the time and recent economic experience favor the eight-hour day.

*Adamson Law.* But only two of the proposed measures were enacted into law. On August 30th, a bill embodying the President's recommendations in regard to the eight-hour day, and the commission of investigation was introduced by Representative Adamson of Georgia, chairman of the Interstate Commerce Committee of the House. Next day a hearing was held at which the representatives of the brotherhoods spoke in favor and the representatives of the railroads opposed. However, it was passed by both Houses and signed by the President, and marks a new step in the settlement of labor controversies. The law provided that after Jan. 1, 1917, "eight hours shall, in contracts for labor and service, be deemed a day's work and the measure or standard of a day's work for the purpose of reckoning the compensation" of employees engaged in operation of trains. Further, it required the President to appoint a commission of three to investigate the operation of the law for a period of six to nine months and to make a report to the President. Opinion in the country was sharply divided between those who held that the unions had scared the President and intimidated the country and those who held that the President had taken the best and only possible course under the circumstances. Candidate for the presidency, Charles E. Hughes, made an important campaign issue out of the manner of settlement and the importance of preserving the principle of arbitration.

In October President Wilson announced the selection of General George W. Goethals, Edward E. Clark of the Interstate Commerce Commission, and George Rublee of the Federal Trade Commission as the board to investigate the workings of the eight-hour law. This board must report to Congress not less than six months nor more than nine months after the eight-hour day goes into effect. The railroads are forbidden by the law to reduce wages until 30 days after the presentation of the report of this board.

*Constitutionality.* The railroads at once made preparations to test the constitutionality of the Adamson Law. The Missouri, Oklahoma, and Gulf Railroad Company sought in the United States District Court of Kansas City an injunction

tion against the enforcement of the law. On November 22nd, Judge Hook of that court declared the law unconstitutional, but his opinion was hastily rendered in order to get the case speedily before the Supreme Court. The matter was to be argued before this latter court in January. Meanwhile both railroads and men perfected elaborate organizations to carry on the contest. The railroads were supported by a large number of industrial concerns organized in the National Industrial Conference Board; while the 400,000 trainmen involved in the original dispute were supported by 300,000 others and by the American Federation of Labor. The railroad spokesmen announced that they "would fight to the end," while W. G. Lee, head of the Brotherhood of Railway Trainmen, retorted that "a strike vote is still in effect," and President Gompers of the American Federation of Labor declared that "whatever steps the railroads may take to kill the Adamson Law, that law is going into effect on January 1st, and it will be enforced." There thus appeared prospects of a huge industrial contest in 1917. Toward the end of December a conference of managers and union officials took place in New York City with a view to arriving at a working agreement pending the Supreme Court decision. The brotherhood chiefs demanded that the law go into effect on January 1st and remain valid regardless of the Court's opinion until the termination of judicial proceedings. About \$5,000,000 in wages per month were involved. The railway heads insisted that the law should not begin to operate until upheld by the highest court and announced that they had agreed with the Department of Justice to keep a full record of all excess pay due under the law after January 1st. The conference adjourned after only one and one-half hours' discussion without any agreement. The union leaders then on December 29th referred the situation to members.

*Compulsory Investigation.* In his address before Congress on December 5th President Wilson outlined his strike prevention proposal first suggested when the Adamson Law was enacted. He pointed out that provision for full public investigation of industrial disputes and the granting to the executive of power to operate railroads in time of war or other public necessity would, together with the undoubted power of the Interstate Commerce Commission to regulate rates, constitute "a programme of regulation, prevention and administrative efficiency." He favored some modification of the Canadian Law requiring the compulsory investigation of industrial disputes before a strike or lockout may be legally declared. He carefully distinguished between compulsory investigation, which would prevent the cessation of industry while the facts were being made clear to the public, and compulsory arbitration which would force employees to remain in a position of employment against their wills. He said, "To pass a law which forbade or prevented the individual workman to leave his work before receiving the approval of society in doing so would be to adopt a new principle into our jurisprudence which I take it for granted we are not prepared to introduce. But the proposal that the operation of the railways of the country shall not be stopped or interrupted by the concerted action of organized bodies of men until a public investigation shall have been instituted which shall make a

whole question at issue plain for the judgment of the opinion of the nation is not to propose any such principle. It is based upon the very different principle that the concerted action of powerful bodies of men shall not be permitted to stop the industrial processes of the nation—at any rate, before the nation shall have had an opportunity to acquaint itself with the merits of the case as between employee and employer, time to form its opinion upon an impartial statement of the merits, and opportunity to consider all practicable means of conciliation or arbitration."

This proposal aroused most bitter opposition on the part of labor leaders and socialists and most enthusiastic support from employers and the public press in general. Most of the former refused compulsory investigation with compulsory arbitration. Thus President Gompers of the American Federation of Labor said, "Involuntary service can not be enforced under the Constitution of the United States. You may make strikes illegal and may make them criminal, but you are not going to avert strikes when strikes are necessary in order to express the needs of America's workers for a higher and better consideration of their rights." Other similar comment declared the proposal "a blow at the vitals of organized labor," "enslaving labor," as only a preliminary to "continuous trouble and slavery." On the other hand, the public press in general praised the proposal as an absolutely essential step in preventing future holdups by organized labor and as laying the basis for intelligent public judgment on industrial disputes of vital interest to the business and welfare of the country.

*RAILROAD SWITCHMEN.* The Switchmen's Union of North America early in the summer demanded an eight-hour day, an advance in wages and overtime pay at time and one-half, the demands being submitted to 13 railroads. Six thousand men were immediately affected, but 60,000 switchmen were indirectly interested. On August 7th the Union and the Conference Committee of the Railways agreed to submit the dispute to arbitration under the Newlands Act. In addition to their own representatives Judge Charles B. Howry of Washington and Prof. J. W. Jenks of New York University were named neutral arbitrators. Public hearings were held from November 13th to December 8th. The award granted an eight-hour day, an increase of pay of five cents an hour, payment for overtime at usual-time rates, and made minor regulations regarding time and payment.

*THE BOSTON ELEVATED RAILWAY COMPANY.* The following provisions were the chief ones in the articles of agreement between the Boston Elevated Railway Company and the Amalgamated Association of Street and Electric Railway Employees of America. 1. All differences which cannot be mutually adjusted by committees to be referred to boards of arbitration composed of one member chosen by the company, one chosen by the association, and a third selected by these two. 2. Employees not to be discriminated against because of membership in the association. 3. One day off in 15 to be granted upon request. 4. All employees guaranteed not less than six and one-half hours' pay provided they remain on duty as long as required not to exceed 14 hours. These articles are effective for three years from May 1, 1916.

PROTOCOL OF HART SCHAFFNER AND MARX COMPANY AMALGAMATED CLOTHING WORKERS. This new agreement superseding the one of 1911 was made April 14, 1916, and is to run for three years. It provides for a preferential union shop, a trade board consisting of a representative of each side with an impartial chairman for adjustment of grievances, and an arbitration board as a court of last resort. It retains all the essential machinery of the old agreement. A reduction was made in working hours from 52 to 49 a week, and there was a 10 per cent increase in wages. A minimum wage of \$9 a week is fixed for women apprentices and \$12 for men. In order to avoid abrupt changes in establishing these standards, the increases are to take effect progressively in from three months to two years. A characteristic feature of the settlement is that the 10 per cent increase is not to apply without distinction to all employees, but at the request of the union the greater proportion is to go to those receiving the least wages. Wage increases thus ranged from 20 per cent for the poorest paid to 5 per cent for the best paid.

COLORADO COAL COMMISSION. This was a Congressional body appointed to deal with the labor disturbances in the Colorado coal fields during the year 1914-15. It submitted its report to the President in April. The report reviewed the general conditions in the Colorado coal mines with special reference to arbitration and conciliation, the checking system, and the discrimination against trade union members. The report pointed out that the fundamental causes of unrest had been greatly modified by the enactment of State laws creating an industrial commission with large powers, providing workmen's compensation, and permitting the formation of mutual insurance companies to carry such compensation. Moreover, laws were enacted providing that checkweighmen be selected and paid by the coal miners themselves. In addition the Welfare Plan of the Colorado Fuel and Iron Company which was put into operation Oct. 1, 1915, greatly affected the underlying conditions because it regulated by contract many of the relations of employees to the company. The new State Industrial Commission was given powers of compulsory investigation, very much after the manner of the Canadian Industrial Disputes Investigation Act. Either a strike or a lockout is forbidden during 30 days pending investigation; but while the Canadian Law is limited to "industries affected with a public interest" the Colorado law applies to all industries whatsoever. Under the welfare plan each employee is guaranteed the right to belong to a union or not, as he pleases; men in each mine may choose their own representatives in carrying out an elaborate scheme of mutual coöperation of company and employees; and each employee is given a right to appeal from his immediate foreman to higher officials up to the president of the company. This right of appeal was found to greatly lessen the arbitrariness of local officials. Moreover, employee representation on four joint committees, dealing with industrial coöperation and conciliation, safety and accidents, sanitation and housing, and recreation and education, has greatly lessened antagonism toward the corporation.

NORWAY. By a law of June 9, 1916, the royal authorities of Norway are permitted to compel

arbitration of such disputes as involve matters of grave public concern. But such authority is to continue only so long as the European war lasts. The Arbitration Act of Aug. 6, 1915, already secured compulsory investigation of labor disputes, incorporation of associations of employees or employers, and the legal recognition of collective agreements. Originally this act had been a compulsory arbitration law, but was defeated by opposition on the part of both employers and employees. Under the new law, conditions of work, hours, and wages must continue unchanged pending reference to arbitration; and the determination of the arbitration court takes the form of a collective agreement which becomes a definite legal contract of employment. Hence a strike for determining the application of a collective agreement becomes illegal. No agreement is to remain in force longer than three years unless both parties stipulate otherwise. The court established under the new law consists of a chairman and four associates with alternates for the latter. The national associations of employees and employers are equally represented by these associates, while the Crown appoints the chairman.

SWEDEN. A report of the Labor Department published in 1916 presented a historical review of industrial disputes in Sweden, analyzed the principles involved in legislation for settling disputes, and made proposals for a new law. It arrived at the conclusion that compulsory arbitration in Norway, Australia, and New Zealand was not sufficiently successful to warrant final judgment. The proposed law would increase the authority of conciliators and make possible the enforcement of arbitration awards in certain cases. It strongly favored collective agreements to be in force from one to five years and having the quality of legal contracts. The law provided that during the continuance of a collective agreement a strike or lockout would be prohibited. The principle of compulsory investigation was adopted in the prohibition of strikes unless at least seven days' notice had been given; and also for two days after notification by a conciliator of his purpose to intervene. A special arbitration tribunal of seven members including employers' and employees' representatives and appointed by the Crown was proposed. The law would become applicable Jan. 1, 1918.

**Bibliography.** Among books on this subject published in 1916 were the following: G. E. Barnett and S. A. McCabe, *Mediation, Investigation, and Arbitration of Industrial Disputes*; Julius H. Cohen, *Law and Order in Industry*; George M. Jones, *The Control of Strikes in American Trade Unions*; Carl H. Mote, *Industrial Arbitration. A World-Wide Survey of Natural and Political Agencies for Social Justice and Industrial Peace*; M. T. Rankin, *Arbitration and Conciliation in Australasia*; J. D. Rockefeller, Jr., *The Colorado Industrial Plan*.

**ARCHÆOLOGICAL INSTITUTE OF AMERICA.** In conjunction with the American Philological Association and the College Art Association of America, the Archæological Institute held its eighteenth general meeting at Washington University, St. Louis, December 27-30, 1916. F. W. Shipley was re-elected president and Mitchell Carroll general secretary. John Williams White and Francis W. Kelsey are honorary presidents. At a joint session Mr. Shipley presided and the president of the Philological

Association, Prof. Carl Darling Buck, presented a paper on "Comparative Philology and the Classics." At other sessions the following presided: Charles C. Torrey, chairman of the managing committee of the American School in Jerusalem; William H. Holmes, chairman of the managing committee of the School of American Archaeology; John Picard, president of the College Art Association; and Andrew F. West, chairman of the School of Classical Studies of the American Academy in Rome. Among others, addresses were made by Ellsworth Huntington on "The Relation of Climatic Changes to Archaeological Studies"; Charles C. Torrey, "The Art of the Hairdresser in Ancient Babylonia"; Herbert Richard Cross, "The Study of American Art in American Colleges"; John Adams Scott, "The Close of the Odyssey"; Paul Shorey, "Illogical Idiom." The president, in his annual report, discussed the effect of the European war upon schools supervised by the Institute. The American School for Classical Studies at Athens had but one student in residence, but most of the staff remained in Greece conducting scientific investigations. The School for Oriental Research in Jerusalem will be discontinued until the end of the war. The American School of Classical Studies in Rome, which when amalgamated with the American Academy in Rome passed from the control of the Institute, is to be related to it again by a new joint advisory council.

The School of American Archaeology at Santa Fé has developed greatly within the last year. The director collected and installed an important archaeological and anthropological exhibit at the Panama-California Exposition at San Diego. The State of New Mexico raised its annual contribution to the Museum of American Archaeology from \$5000 to \$10,000 and gave \$30,000 toward the erection of a \$60,000 Art Museum building. A Museum of Ethnology has been established at San Diego and will utilize certain of the permanent exposition buildings. At the end of 1916 the property of the School was valued at about \$500,000. During the year excavation or studies were made on the Pajarito Plateau (by the director, Edgar L. Hewett), in Chaco Canyon, in the Rito de los Frijoles (Frank Springer), in the Manzano district (J. L. Nusbaum), at Pecos (Dr. A. V. Kidder), and at Otowi (Dr. L. L. Wilson).

After ten years as editor-in-chief of the *American Journal of Archaeology*, Prof. Harold North Fowler is to retire. In 1916 another periodical published by the Institute, a nontechnical archaeological magazine called *Art and Archaeology*, was converted into a monthly and largely improved. The treasurer reported an excess of receipts over expenditures. The membership is about 3000. The following deaths were announced: Seth Low, second president and later honorary president of the Institute; Horace Davis, founder and a president of the San Francisco Society; Eckley B. Coxe, Jr., president of the Pennsylvania Society; Lucius M. Cuthbert and Joel F. Vaile, president of the Colorado State Society.

**ARCHÆOLOGY.** The continuation of the European war has prevented archaeological investigation to any considerable extent.

In Egypt, however, which is somewhat aloof from the turmoil of war, several sites have been examined. At Gebel Barkal, Reisner has been at

work upon the pyramids located at that place. The excavations betrayed the fact that they were always so located that their approach faced the river. Unfortunately these funeral monuments had been visited and plundered in antiquity, so that little remained to tell their story. Fragments of pottery, however, made it clear that these buildings are of Meroitic date. On the same site, also, much work was done on the temples. The earliest work done upon these temples is that of Thothmes III. This is followed by that of Thothmes IV and Rameses II. In all cases the information is afforded by sculptural remains. After Rameses II there occurs a long gap, in which no kings are mentioned, until Tirhakah and the succeeding, less known, Ethiopian rulers. One Meroitic king left a conical sandstone block covered with sculptured necklaces and other ornaments. This stone is believed to be the decorated omphalos of Ammon. This king, Manach, by name, had as well the prænomen Nebmare, which belongs also to Amenhotep III.

At Memphis the Coxe Expedition has been busy. Here close to the temple of Meremptah, the investigators discovered a large palace. This find is of importance, since very few palaces have been discovered so far and our knowledge of Egyptian domestic architecture is very limited. This is the first structure of its kind to be found at Memphis. The palace was originally about 180 feet in length and about 100 feet broad. In it were twenty or more rooms of different sizes. Apparently the building had been attacked by fire, for several of the rooms show traces of scorching. In what is thought to be the throne room many valuable finds were made. Among these may be mentioned a bronze which evidently once belonged to a chariot, a number of bronze lamps, gold earrings, and necklaces. Along with these were many scarabs, and since some of these objects go back in time to the sixth dynasty the inference to be drawn is that the owner of the palace must have been a collector of antiques. Particularly interesting was the discovery of several doorways which were executed in the finest style of architecture; one of these was inlaid with a kind of faience; another was similarly treated with gold.

At Abkah, in Nubia, the expedition of the Peabody Museum discovered a number of early dynastic burials of the usual sort. One or two new characteristics appeared. Thus one of the burials showed a body with a cloak of feathers over the shoulders, while another showed a body with a feather headdress upon the head. Not far from these archaic interments were discovered three or four graves dating from the New Empire. One of these burials, for example, contained a good specimen of black-topped pottery, associated with the usual pottery of the New Empire. Near Gammay, about 2 miles distant from Abkah, were found extensive predynastic cemeteries of late date. These had been thoroughly rifled. Near the river was discovered a small Meroitic cemetery (Romano-Nubian) from which five excellent classic bronzes were recovered. Part of this cemetery was covered by pagan burials of the third and fourth centuries of the Christian Era.

At Thebes the expedition of the Metropolitan Museum of Art has been working upon the tomb of Pu-im-rê. The rock roof and walls had collapsed in ancient times, breaking into bits the



reliefs which had decorated the tomb. Several hundreds of these fragments have been recovered and in many instances preserve the original colors in an almost perfect condition. In the sunken court of the "Biraba" most of the coffins had been riddled by white ants. However, a large number of bronze vessels, toilet utensils, weapons, scarabs, pieces of musical instruments, and a foundation deposit of the time of the Rameses were recovered.

At Thebes, also, Ernest Mackay, acting for Mr. Mond, discovered two tombs which had been lost sight of since the time of Lepsius. One of them was the tomb of Nebenkême, a military officer who lived in the time of Thothmes III and Amenhotep II. The other tomb was that of a counter of the grain of Amûn. The name of this official, however, had been erased when at a later date the tomb was used by Mahu, an official high in command in the Ramesseum.

**AFRICA.** Several Christian tombs have been discovered at Carthage. In one of them was found a marble sarcophagus which contained the body of a woman richly adorned with jewels. Among these jewels was an emerald and ruby necklace with clasps of uncut precious stones. Besides these were heavy gold pins, buckles, and rings, as well as other valuable objects which were sewn on the garments.

**GREECE.** The excavation of the American school last spring at Corinth brought to light some interesting prehistoric vase fragments. Among these may be mentioned some fragments that unquestionably were brought from Crete, particularly a very fine pitcher of Late Minoan I or Early Minoan II style. Besides these there turned up some cups with Late Minoan I designs done in the regular excellent Mycenaean technique but not of Cretan origin. This is a new ware and appeared in only two or three instances at Tiryns. At Hexamitia the same school found some neolithic, dull-painted ware in connection with very little Mycenaean.

About 150 feet outside the citadel wall of Tiryns was found a copper kettle, a copper tripod, a fine piece of the same metal covered with reliefs of birds and animals, a copper plaque, swords, brooches, and potsherds. The kettle proved to be a veritable treasure house, for in it were 500 gold beads, gold wires upon which in all probability the beads had been strung, several plaques of gold, studded with jewels, pieces of conical-shaped money, a number of amber beads, a golden wheel with spokes of amber, and a tube stamped with hieroglyphics. Most important of all in the find were some gold rings. Of one of these the setting is engraved with a boat from which several persons are disembarking, while four men and women on shore wait to greet them. The bezel of another shows a goddess seated on a throne while four lions bring offerings to her. In the background is a tree on which is a bird. Behind the tree appear the sun and the moon. These objects date about 1200 B.C.

In Northern Greece several finds have been made in the territory now within the war zone. At Lake Langaza in the Balkans a tomb of classic times was found. It contained a skeleton adorned with objects of bronze and gold. At Salonika, or rather in the vicinity, many antiques have come to light in the course of digging the trenches. Among them may be men-

tioned gold and bronze rings and incised geometric pottery. On the site of Pella French troops have found statuettes, vases, and marble stelæ. This, it will be remembered, is the site made famous by Philip.

At Koráko, some three kilometers to the west of New Corinth, the American School conducted excavations for six weeks during the summer of 1916. The site lies on a low bluff just above the Gulf of Corinth. Test pits demonstrated the fact that the hill is covered to a depth of four to five meters with the debris of successive prehistoric settlements. Several foundation walls of stone bedded in clay, and several layers of clay (originally sundried brick) show as many as eleven superposed strata of occupation of the site. Three periods are easily characterized by the remains of pottery. The first is represented, in the two to two and one-half meters of deposit above the bed rock, by so-called *urfirnis* ware. This ware is hand made and either unpainted or varnished or monochrome decorated ware. A typical form of the first class is that of a straight-sided flaring bowl, and this type of ware differs from that of the second group only in lacking the thin varnish-like slip which appears in the latter. The second group is represented by more fragments and has as a characteristic form a shape somewhat like a wine-skin. The monochrome ware, well-made, shows red or black surfaces, on one of which patterns are picked out in dark paint on the light ground.

This primitive period, which runs from about the end of Early Minoan I period to Middle Minoan II, came to an end with a fire which left a thick bed of ashes. Immediately above this appears a second layer of deposit from one to about one and a half meters in thickness. This is characterized by the predominance of Minyan pottery. This ware is wheel-made of a fine gray clay with a smoothly polished surface of a soapy feel. This is never painted but is sometimes decorated with incised lines filled with white material. The shapes are graceful and seem imitated from metal or stone ware. This is probably an imported ware.

Along with this Minyan ware occurs a dull-painted, pre-Mycenaean geometric. The shapes are pithoi large jars, bowls, and basins and vary from coarse to fine ware. The decorations become polychromatic in the later phases. One of the pithoi contained the skeleton of a child.

This period, which extends from Middle Minoan II to Late Minoan I, passes over suddenly into the third period, which is Mycenaean in character.

The third period deposit reaches down from the surface of the ground for about 1.20 m. It shows four levels of occupation, and from it a vast quantity of Mycenaean pottery was recovered. One pit alone produced over nine thousand fragments. From these some hundred vases dating from the Middle Minoan III to the Late Minoan III period were reassembled. A number of fragments belong to Cretan importations.

From this stratum of deposit a new type of Mycenaean ware was recovered. It has arbitrarily been called "Ephyraean" and belongs in the latter part of the Late Minoan I period. It seems to be confined to one shape—a deep two-handled goblet with a low shank—and the clay varies from buff to yellowish-green. The

ware is glazed in and out with a buff or greenish slip, on which Late Minoan I designs are painted in red (on buff ware) and black (on yellow or greenish). The decorations are more often lilies or rosettes or spirals. One large flower usually appears on each side of the vase.

In the first period the foundation walls show the stone laid in clay for mortar and numerous indications of the employment of sundried brick were at hand. No complete house has yet been excavated. In the second or Minyan period, however, a dwelling has been cleared. It measures about 11.40 m. by 4.50 m. The southern front is rectangular, the north apsidal. The foundation consists of walls about .30 m. thick made of small stones bedded in clay. In this foundation rested the house walls of sun-baked brick. The internal arrangements show two cross walls, one of which shuts off the apse while the other, near the southern end of the house, makes a room at this end about 2 m. wide. This may have been a vestibule. In the central room, which is about 6.20 m. long, is the hearth. There are no indications of columns, as at Tiryns, to support the roof. From this room a door opened out to the west. The floor was packed with earth.

The clearing away of a large portion of the top of the hill brought to light a large number of foundation walls of the Late Minoan III period. The plan of six houses can be made out of the complex. From these it has been determined that the ordinary house of this time at Koráko was a long rectangular building. At one end was the entrance which led into a vestibule, which in turn opened into a large room—the megaron. Near the centre of this is a hearth with a column-base near by. This may have supported a "baitylon" with which the family worship was associated. Behind the megaron are sometimes one sometimes two rooms, each with a hearth. In one instance at least to judge by vase fragments, these rooms may have been kitchens.

A few trial pits sunk at Giriza not far from Hexamilia showed fragments of vases from the *urfirmis* period. The finds show that this period was of long duration.

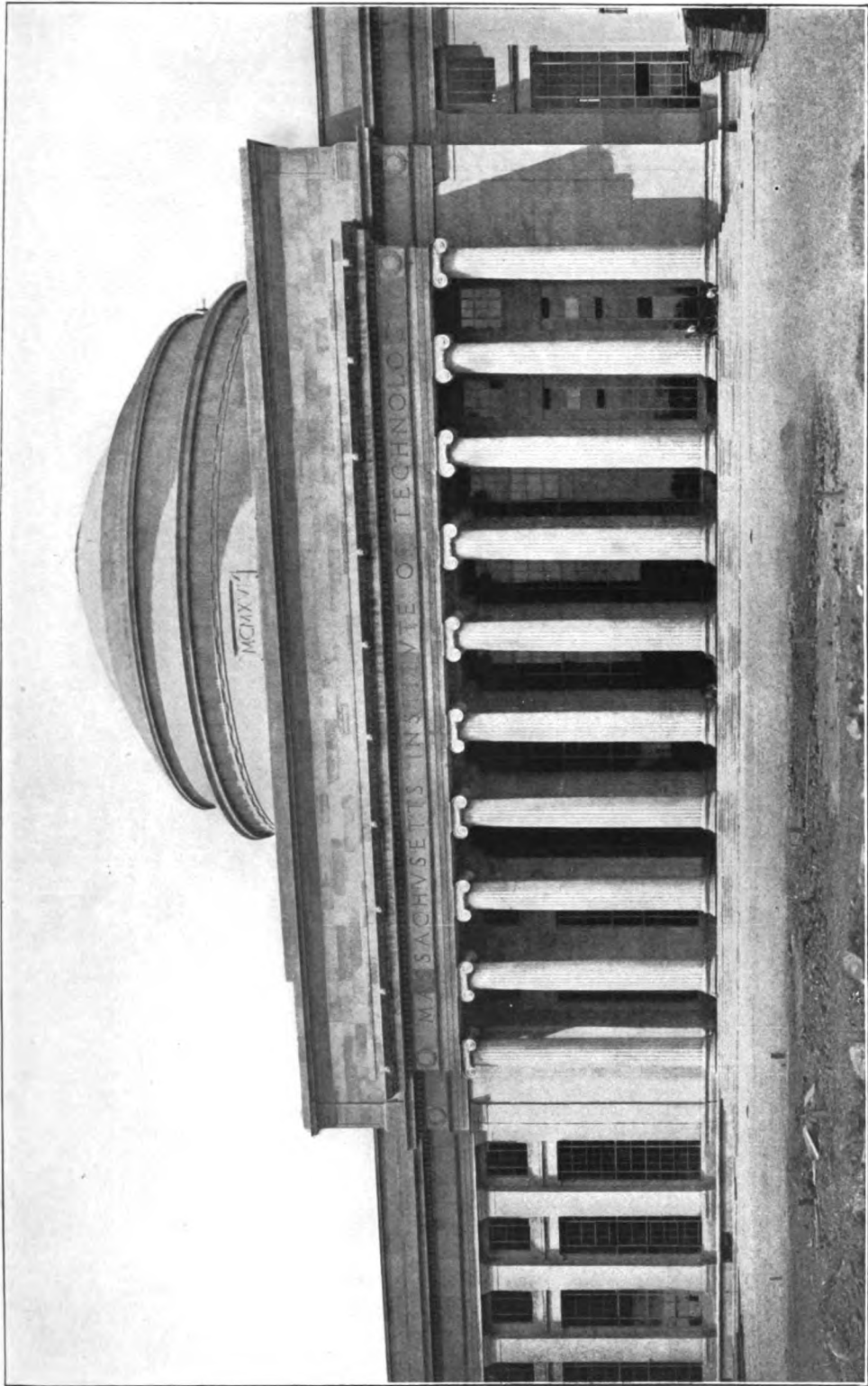
ITALY. At Bettona, ancient Vettona, work has been done on an Etrusco-Roman tomb which dates in the third century before our era. The tomb, a splendid example of massive stone work, has a chamber which measures 7.86 meters by 4.25 meters. The floor is arranged with a series of steps which give an amphitheatral effect. From the excavations a number of earrings, bracelets, and rings were recovered. One of the latter shows a cameo carved with a beardless male head in profile. At Caere, modern Cerveteri, a cemetery street has been explored. The tombs, which belong after the fifth century B.C., are located side by side upon this street. The Italians have also continued their work on the Via dell' Abondanza at Pompeii. The house of Trebio Valente has also been excavated. In the peristyle of this building were found the skeletons of four persons. In Rome in the Via Labicana the *Casa Rossa* has been partially excavated, with the result that several rooms have been laid bare. One of these measures 7.75 meters by 5.8 meters and is paved with mosaic. In the same city also some interesting funeral monuments have come to light at the end of the Villa Volkonski-Campanari, between the Via S.

Quintano and the Via Santa Croce di Gerusalemme. The burial chambers, which were vaulted, still contained the ashes of the dead, preserved in urns. Portraits of the dead appeared in reliefs which also carried inscriptions and names of freedmen of the *Gens Quinta* and *Clodia*. The inscriptions forbid the use of the tombs by succeeding generations. In the island of Sardinia excavations have been carried on at Laerru upon the tumuli and "tombs of the giants." At Vignanello, in Etruria, the town and the necropolis have been excavated. One of the tombs opened was perfectly preserved, although the vases found therein were badly broken. The *dromos* of the tomb was 14 meters long and 1.28 meters wide. The tomb contained potsherds dating from the sixth to the third century B.C. Among the finds was a kylix in the style of Charchrylion and a stamnos of the severe red figured style of vase painting. In tomb III was found a fine tripodic bronze candelabrum.

**ARCHBOLD, JOHN DUSTIN.** An American capitalist, a leader in the oil industry of the country, died at Tarrytown, N. Y., Dec. 5, 1916. Of Scotch-Irish ancestry, he was born in Leesburg, Ohio, in 1848, was early a clerk in a general store, and as a youth went with his parents to Titusville, Pa. There he became identified with the Acme Oil Company, and rose in it to a position of influence. The company was considered the bitterest enemy of the South Improvement Company, which developed into the Standard Oil Company, with the Rockefeller interests behind it. John D. Rockefeller became impressed with young Archbold's initiative and ability, and secured his services. From that time, 34 years ago, he had grown steadily in importance as a dominating force in the corporation. When the Standard Oil Company was dissolved in 1911 through government action, Mr. Archbold was its vice-president. In the reorganization then effected he became president of the Standard Oil Company of New Jersey, the most important of the new units. Mr. Archbold came before the public in several striking situations. He seemed to be the chief fighting man of the Rockefeller forces, and was never unwilling to take the stand in vigorous defence of the methods employed in the oil industry. In 1912 letters which, he claimed, had been stolen from his files and sold, were published by William Randolph Hearst. They apparently showed close relations between Standard Oil and several prominent politicians, including Senator Joseph B. Foraker of Ohio. Within the same year, a tilt occurred between Mr. Archbold and Theodore Roosevelt, the former asserting that Mr. Roosevelt, when a candidate for President in 1904, knew that the Standard Oil had contributed \$100,000 to the Republican national campaign. Mr. Roosevelt thereupon added Mr. Archbold to the membership of the Ananias Club. Mr. Archbold was president of the trustees of Syracuse University and gave large sums to that institution, including \$500,000 at his death. He left to his family a fortune of \$25,000,000, acquired wholly through his oil interests. He was buried in Sleepy Hollow Cemetery.

**ARCHITECTURAL LEAGUE EXHIBITION.** See PAINTING AND SCULPTURE.

**ARCHITECTURE.** In the past year, which has been one of more than ordinary prosperity



MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
LIBRARY AND ADMINISTRATION BUILDING  
William Welles Bosworth, Architect



for the United States, building has been active throughout the country. In the two years preceding, however, a great many building projects of major importance were carried on, as may be learned specifically from the reviews of ARCHITECTURE in the 1914 and 1915 YEAR BOOKS. Even during the time when conditions in Europe most acutely affected American business, the most conspicuous falling off in building operations took place in residential architecture. In other types of building it would be difficult to prove that conditions in Europe caused any significant difference in the projecting or completion of the normal and usual variety or importance of architectural undertakings.

In a brief review it is impossible to give complete lists of buildings or of architects. Specific buildings mentioned are given as typical examples in each case, and with due recognition of the impossibility of making such lists complete. In like manner the names of architects in certain cities or localities are given here for reference value and intended to comprise only the most conspicuous practitioners.

It has been an interesting practice of architectural critics to deduce from the completed work of a year or a decade various observations upon the growth of certain styles or certain schools of architecture. Accurate deductions of actual value are virtually impossible because of the nation-wide eclecticism of architecture in the United States. Despite the predominance of certain architectural styles in certain localities, it is always possible to see a country-house of Elizabethan "half-timber" derivation in Lower California, and a white-walled, tile-roofed "Mission" country-house at Newport, R. I. Our architecture is consistent only in its inconsistency, and it is rarely possible to trace "tendencies" which are either continuous for any length of time, or generally uniform in any given locality.

The following review, then, is designed to summarize the present degree of attainment which has been reached in the several types of building considered, as well as to record certain specific works of the year.

**EDUCATIONAL BUILDINGS.** A year seldom passes without witnessing the completion of at least one architectural project of the first magnitude. The year 1916 can record the opening of the principal buildings of the great group designed for the Massachusetts Institute of Technology, by William Welles Bosworth, a graduate of the Institute, in the Class of '89. The impressive alignment of buildings on the Cambridge bank of the Charles River, across from the "Back Bay" section of Boston, declares at once the architect of Beaux-Arts training. The superficial aspect of the group shows a broad architectural intention, excellently carried out. Dignity, symmetry, and the classic ideal are the architectural fundamentals of the whole, and liberal funds have made it possible for the officers of the institution, and for the architect, to erect buildings essentially modern in every technical and mechanical detail of construction and equipment.

The centre of the group is marked by a domed building, with a splendid Ionic colonnade, not unlike McKim, Mead & White's immortal Columbia Library. Upon each side of this are symmetrically disposed the other buildings, which flank a great three-sided court, open to

the river front. The technology buildings are to be recorded not only as one of the most noteworthy of the world's educational groups, but as one of the finest of large architectural projects carried out in this country.

Colleges throughout the country yearly add a dormitory or a single building, but are seldom enriched by any such significant addition as the "Scholastic" Gothic Graduate School building, at Princeton, by R. A. Cram.

Work continues on the permanently important West Point group, on the Hudson River, one of the most remarkable achievements of the now dissolved firm of Cram, Goodhue & Ferguson, but in this group the entire scheme was laid out and agreed upon many years ago.

Like other architectural expression in the United States, collegiate architecture is consistent neither nationally nor locally. In several cases the "Harvard" type, of brick and stone, a Georgian Colonial style, prevails, while the buildings of Princeton, University of Pennsylvania, Washington University in Illinois, and Bryn Mawr College in Pennsylvania, show well-considered renderings of the English type of "Collegiate" or "Scholastic" Gothic architecture by Cope & Stewardson, Day & Klander, and other architects.

In the design of public schools, the names of two American architects stand out with merited prominence—W. B. Ittner, in St. Louis, Mo., and E. F. Guilbert, in Newark, N. J.

The past year adds further credit to the former's excellent work in school design, with the Barton School and the Lowry School (both in Minneapolis, Minn.). Local architects are often associated with Mr. Ittner, who is a specialist in schoolhouse design, and in Minneapolis, the firm of Stebbins & Haxby collaborated on both the above mentioned schools. Another new school, of unusually "homelike" appearance is the Mullanphy School, in St. Louis, Mo., also by Mr. Ittner.

The type of school developed to its present high degree of excellence and efficiency by Mr. Ittner, as well as by Mr. Guilbert, has set a type for modern schoolhouse design throughout the country. Essentials observed in the planning and construction of the modern school have been essentials of efficiency as resultant from plenty of light, scientific ventilation and heating, highest sanitary requirements observed throughout, and installation of the best of modern equipment for every department of every building.

In point of style, both Mr. Ittner and Mr. Guilbert, as well as their many followers, have adhered with excellent consistency to various modifications and adaptations of the English scholastic Tudor architecture, traditional from Gothic to Renaissance, and here modernized to a degree of ready appropriateness to the expression of the American school building of to-day.

An important technical school building of the year is the Carter Harrison Technical High School, in Chicago, Ill., by A. F. Hussander, and Salt Lake City, Utah, has also seen the completion of a Technical High School, by Cannon & Fetzner. The style, in the latter building, shows a radical departure from the conventional, and a distinctly interesting expression of the "Modernist" or "Secessionist" type of architecture associated with Frank Lloyd Wright. The building is of brick, confidently handled in a

manner at once structural and decorative, with an introduction of symbolic architectural sculpture as commendable as it is unusual.

Many new school buildings have been erected in California in the past year, their design making up in individual merit, perhaps, what it lacks in the general consistency of the buildings as related to each other.

In general it is to be said that in few types of building has such remarkable advance been made in recent years as in public school buildings, which have become not only agreeable to look upon as works of architecture, but (even more important) as models of efficiency, sanitation, and modern equipment.

**HOSPITALS.** Parallel with the development of the modern school along lines of ever-increasing efficiency is the development of the modern hospital.

One of the most important large hospitals of the year is the New Mt. Sinai, at Cleveland, Ohio, by George B. Post & Sons. Since it is proper that by far the greater part of an expenditure on a hospital building (apart from its actual construction) should go into its equipment, the problem of designing the exterior has resolved itself, in the hands of the best architects, into a matter of creating the most pleasing and cheerful effect with the greatest economy and simplicity of means. Hospitals, as a result, have in recent years lost their former resemblance to second-rate State capitols or penal institutions, and have taken on a sane, suitable, and even inviting architectural guise.

A noteworthy example of the year is the hospital designed by York & Sawyer, of New York, for the United Benevolent Association, of Grand Rapids, Mich., and said to be one of the finest and most expensively equipped buildings of its type in the United States. The architectural style chosen was a happy one—a modified Italian Renaissance, carried out in a mellow-toned brick. Open Palladian loggias, agreeably breaking the wall-surfaces at various points, not only serve the purpose of stylistic expression, but afford ample out-door space for patients who require it. Several of these loggias are at a great height above the ground, so that even a hot day in summer would fail to rob a delicate patient of the best air.

**BANKS.** Few types of building seem less affected from year to year by the spark of inspiration than the bank buildings. Those completed in 1916 are indistinguishable from those of 1915, and those, again, from the year before. It would seem that our architects (or, perhaps, our bankers) had hit upon a decent and imposing ideal for a bank building, and were resolved not to depart from it on any account. The accepted type has much to recommend it, and also little to arrest or surprise the eye of the architectural critic. Each new bank is a variation of the same theme, with differences appearing chiefly as dictated by peculiarities of the site, or by the importance or prosperity of the institution. Each is a partial façade of a Greek temple (Doric, Ionic, or Corinthian), with fine plate glass and, perhaps, a bit of bronze grille-work between the columns. A bronze door admits to a marble-and-bronze interior, each remarkably like all the others, and all displaying a commendable uniformity in the expression of substantial dignity. Much excellent design, in detail, and much fine artisanship is apparent in

the typical modern American bank, and unless a departure from the existing type were obviously superior, we may well take satisfaction in the circumstance that our bank buildings are as architecturally seemly as those we see about us on every hand.

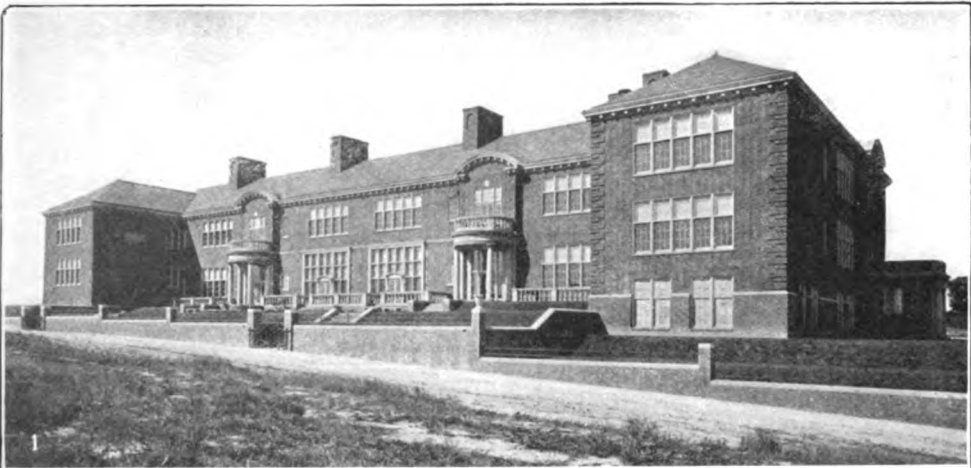
In several cities of the Middle West, however, one architect has designed and erected a considerable number of bank buildings which are not only unclassic in their character, but unlike any specific architectural style. One of these banks, to be recorded as of 1916, is the Merchants' National Bank, of Grinnell, Iowa, designed by Louis H. Sullivan. Mr. Sullivan will be remembered as the first of the Chicago school of architectural "Secessionists," and the originator of an essentially decorative kind of non-stylistic ornament, strangely interlaced and contrived—Oriental, yet not Oriental. This ornament, applied to architectural forms radically differing from all historic precedent, constitutes a distinct and personal contribution to the variety of architecture in the United States. By reason of its surprising and sometimes bizarre qualities, the writer has often regarded it as a strange choice for the architectural expression of a bank building, yet the most captious critic must admit that the results, as seen in a number of important bank buildings by Louis H. Sullivan, are peculiarly pleasing, and undeniably interesting. It may be that they would be less pleasing if encountered in a more conservative community, surrounded by old precedents, while they possess a remarkable architectural spontaneity and freshness in the open-minded and progressive Middle West.

**LIBRARIES AND MUSEUMS.** For the most part, the architectural character of public libraries and museums varies but little, and differences are apparent chiefly in the degrees of merit evidenced by the architect's rendering of an adapted Classic theme.

The most notable building of 1916, in this category, is the Cleveland Museum of Art, Cleveland, Ohio, by Hubbell & Benes. The treatment, as agreeably familiar as it is suitable, makes use of the Greek Ionic order, in a gracious and dignified building of white Georgia marble.

An unusual library building is seen in the Haddington Branch of the Philadelphia (Pa.) Free Public Library, by Albert Kelsey. Here the architect, abandoning the familiar Classic colonnade idea, skillfully blended the local brick-and-stone Georgian Colonial architecture of Philadelphia with an element of modified Italian Renaissance. The result proved pleasing and unique interest was added to the building by the introduction of much symbolic detail, especially in the polychrome glazed terra-cotta soffit of the main entrance arch.

A successful small library at Needham, Mass., by James H. Ritchie, is typical of a recent and highly commendable tendency in most of the older eastern communities of the North Atlantic States. This tendency is toward the use of carefully studied versions of the Georgian Colonial style for small libraries, town halls, churches, and other buildings of public or semi-public nature. Even banks in some small New England towns have been made to most agreeably recall the more substantial and time-honored style of local prototypes, worthily perpetuating our only architectural heritage.



1. Laclède School, Saint Louis, Mo.

2. Bryan Mullanphy School, Saint Louis, Mo

3. Class Room of Bryan Mullanphy School

AMERICAN SCHOOL ARCHITECTURE, 1916  
William B. Ittner, Architect





**HOTELS AND APARTMENT HOUSES.** The erection of large and ultra-magnificent hotels seems to keep pace with the business growth of our larger cities, and the last decade has witnessed the opening of an astonishing number of these remarkable and essentially American buildings.

The hotel as a human and mechanical organism of efficiency and service has been developed to a high degree in this country, the United States, indeed, having devised more conveniences and inventions in hotel equipment than any other country. Hotel building in the United States, moreover, has been practiced on a larger scale than in Europe, with the result that several interesting architectural developments have taken place.

A brilliantly superficial "style" (or composite of style) has been created for the definite purpose of attracting guests, for pleasing and amusing them after they have been attracted, and for subtly flattering them while they are beneath the hotel's roof. Hence the diversity of styles seen in a single hotel, the special rooms carried out in such unusual schemes as mediæval monastery wine-cellars, Assyrian throne-rooms, Pompeian villas or whatnot. There is no thought that any of these may be in even a remote stylistic relationship with the eighteenth century Franco-American exterior—the intention is solely to attract and amuse a novelty-weary public. The opening of the Ritz-Carlton and Vanderbilt hotels in New York City (1911 and 1912; Warren & Wetmore, architects) ushered in a new ideal for hotel architecture, and one which has widely influenced hotel design and furnishing ever since, governing it, for the most part, to-day. Ornate French styles, as well as more restrained French styles, were abandoned in favor of the eighteenth century English style of the Brothers Adam. Plain wall-surfaces took the place of walls of ornate marble or decoration; Adam, Hepplewhite, and Chippendale furniture took the place of French furniture, and to this there was added that eighteenth century English decorative curiosity called "the Chinese taste." The results of the radical change in style, as exemplified by nearly a score of recent hotels, are most pleasing, and it seems as though a better expression of *good taste* in hotel architecture had been achieved without any loss of superficial attraction.

Several large hotels were opened in 1915, and 1917 will see the opening of two large hotel projects now in building progress—the Pennsylvania Hotel, by McKim, Mead, & White, on Seventh Avenue, New York City, close to the great Pennsylvania Railroad terminal, and the Hotel Statler in St. Louis, Mo., George B. Post & Sons, architects, with Mauran, Russell & Crowell, associated. The latter hotel, uniform with the hotels Statler in Buffalo, Cleveland, and Detroit, will be of an architectural character embodying traits of several styles, but exemplifying no one. There will be found some Italian elements, some of the eighteenth century English Adam style, and some connoting Georgian Colonial inspiration. The composite is an agreeable one for modern hotel architecture, and bids fair to hold in favor for some time to come.

An important hotel of medium size, designed in this general vein, is the Robert Treat Hotel, opened in 1916 in Newark, N. J., Guilbert & Betelle, architects

The design of apartment houses, confined, naturally, to cities of such size that artificial housing conditions exist, has shown progressive improvement in recent years. This improvement is evidenced not only in the more attractive superficial appearance of the buildings, but in their planning, construction, and equipment.

Typical of the finest type of apartment house building in New York City, in the year past, is the Astor Court Apartment Building, by Charles A. Platt. Like several earlier apartment buildings by the same architect, Astor Court is designed in a skillfully modified Italian Renaissance, dignified and urbane. Many less pretentious apartment houses have taken the hint from good examples about them, and present a degree of merit which is becoming the rule to-day, instead of the exception of a few years ago.

It seems that owners and operators of valuable real estate are now convinced that "good architecture" is a "good investment," instead of a waste of money. "The Apartment House Medal," awarded each year by the Architectural League of New York for the best design of that year, has done much to direct interest and attention toward the question, not only on the part of the architects, but of the owners and building promoters.

In the Middle West, apartment house design of the year past shows a tendency to depart from stereotyped architectural conventions, and to express a new freedom, together with a certain clever "externality" which may or may not be a good sign. The "St. George" Apartments, in Chicago, Ill., by Norman E. Brydges, is typical of this newer conception of the problem—a conception undeniably attractive even though accepted on probation by the conservative critic.

On the Pacific Coast remarkable success has been attained in the design of "garden apartment houses," by such architects as Irving J. Gill. Here, where land is not at a great premium, rows and groups and blocks of white-walled houses are picturesquely disposed about luxuriantly flowering courtyards, or stepped quaintly up a terraced hillside, with a profusion of vines and planting making them, indeed, "garden apartments," and one of the most unique and engaging of current architectural innovations in the United States.

**RESIDENTIAL ARCHITECTURE.** In no type of building is the stylistic selection of both architect and client so apparent as in the American country house. Critics, having long since abandoned hope of detecting or pointing out any "American style," are now more profitably engaged in studying the varied architectural expression seen in country house architecture as a matter of "derivations."

In so brief a review it is possible only to point out the more conspicuous tendencies apparent in certain localities, with an enumeration of the architects whose beliefs and works to some extent are influential or dominating in these localities.

The most consistent local expression of American domestic architecture is to be observed in Pennsylvania, in the works of a group of architects whose offices are in Philadelphia, and who erect buildings within a considerable radius thereof.

The most conspicuous influence to be discerned in this group comes from Wilson Eyre

(now in the firm Wilson Eyre & McIlvaine), and from Frank Miles Day, in the firm of Day & Klauder. Other Philadelphia architects to be noted for admirable country house work are Cope & Stewardson, D. Knickerbocker Boyd, John T. Windrim, Mellor & Meigs, Duhring, Okie & Ziegler, Edmund B. Gilchrist, Charles Willing, Savery, Scheetz & Savery, and Furness & Evans. Wilson Eyre developed and still practices a style which combines the picturesque elements of the English country house, both old and new, with local materials and modern American needs. Evidences of his influence are apparent in the works of nearly all the Philadelphia architects. Skillfully blended with this picturesque type of domestic architecture, or carried out alone, is a fine revival of early local types of Colonial farm houses. Philadelphia architects of large and monumental projects are Horace Trumbauer, Albert Kelsey, and Edgar V. Seeler, the last named being the architect of the large building completed in 1916 for the Penn Mutual Life Insurance, on Independence Square, diagonally across from the great Curtis Publishing Plant, an earlier work of the same architect.

Observation of work in the vicinity of New York discloses no consistent effort toward any one type of expression in domestic architecture. Able architects too numerous to list have been busy in the year past, in residences for both town and country, many of these of great magnitude, and representative of great expenditure. Most notable, perhaps, are two large country houses by John Russell Pope, one for Mr. Ogden L. Mills at Woodbury, L. I., the other for Mrs. Arthur Scott Burden at Jericho, L. I. Two similar houses of the year, of equal importance, are for Mr. G. Hewitt Myers at Washington, D. C., and for Mr. J. S. Frick, at Baltimore, Md. In all four of these large country houses the architect has employed an adaptation of the Adam style in a manner professionally interesting and superficially attractive. Charles A. Platt continues to occupy his place as the American architect preëminently master of the adapted Italian villa, though each year witnesses marked advances in the sympathetic rendering of the type by others. A notable "Italian villa" completed in the past year is the house and gardens for Mr. H. H. Rogers, at Southampton, L. I., by Walker & Gillette, architects. No published work has appeared in the year past from the offices of Harrie T. Lindeberg or Aymar Embury II, both of whom are noted as the designers of highly successful American country houses.

The region of New York, however, affords no opportunity for a descriptive summary because of the wide diversity of stylistic expression, and even a lengthy enumeration could develop no conclusions differing in any way from conclusions which might be made the preceding year, or earlier years.

Architects in the South appear to have developed no distinctive convictions regarding domestic architecture, for we find no publication of conspicuous examples, nor any evidence of the influence of any one leading spirit. Each year there is a considerable amount of building in the South, but no great architectural achievements. The most interesting one which has come to the writer's attention is a great palace which is called a "ranch house" on a million

acre ranch near Kingsville, Texas. Perhaps the most interesting feature of this Santa Gertrudis ranch house (Adams & Adams, architects) is its fireproof construction, and the scale of the entire establishment, farm buildings, etc., of which it is a part.

Domestic architecture in the Middle West, centering about Chicago, has for many years presented a great quantity of lively material for study and observation.

Roughly speaking, the influence is a dual one, and part of each year's output shows the exuberance of the "Secessionists," the other part the earnestness of the "Conservatives." In the forefront of the Secessionists is Frank Lloyd Wright, and other architectural "free-thinkers" whose works are numerous are William Drummond, Von Holst & Fyfe, Tallmadge & Watson, and George W. Maher.

The most important Conservative, an architect of extensive practice and remarkable versatility, is Howard Shaw. Despite the fact that architectural radicals have for some years made active efforts to develop a distinctive type of Middle Western domestic architecture, each year sees the erection of a far greater proportion of houses in all respects similar to those of the East.

The development of a characteristic type of American country house in California is favored by its peculiar climate, its Spanish mission precedents, and its distance from distracting outside influences. There are several distinctly Californian types, notably that derived from the Spanish missions, that developed from Japanese architecture, and a remote adaptation of the Swiss chalet. There are, as well, many notable examples of frankly adapted European styles, of which the Italian villa is the most appropriate.

The following architects are among the most able and prominent of the Pacific Coast: Bliss & Faville, Elmer Grey, Myron Hunt, Robert D. Farquhar, Willis Polk & Co., Lewis P. Hobart, Greene & Greene, L. C. Mullgardt, Irving J. Gill, and Arthur R. Kelly.

**CHURCH ARCHITECTURE.** The past year has not seen the erection of any epoch-making church edifice, unless we accord such a marked designation to the great Cathedral of the Immaculate Conception at Ferdinand, Indiana, by Victor J. Clutho. Here is an enormous Romanesque cathedral of brick, admirably handled in detail, and of immediately impressive mass.

The style of this cathedral reminds us that recent years have seen an increasing number of churches — especially small churches — designed in the Romanesque manner. It may, indeed, be a tendency which will go further, and cause the pendulum to swing (perhaps but temporarily) away from Gothic adaptations and back to the Romanesque, which was so ardently introduced in this country by H. H. Richardson in 1874.

The Romanesque style, perhaps, is more readily rendered to-day by the average American architect, than the Gothic style, and for this reason the increasing tendency noted above may be an excellent one.

Few American architects other than Cram, Goodhue & Ferguson (now practicing separately), have ever achieved really worthy Gothic buildings, considered as stylistic expressions, or even considered regardless of style.

American church architecture, taken during

the year past, or through previous years, reflects less distinction and credit on our architects than most of their other works, though of course there are happy exceptions, and always the exception of Cram, Goodhue & Ferguson. Certain important works from the hand of Mr. Goodhue are still incomplete, and Mr. Cram's work on the Cathedral of St. John the Divine in New York City is ever in a mutable state, aside from the finished work of a few years ago on the Deanery and several other subsidiary buildings.

On the Pacific Coast there have been erected a profusion of small churches, many of them very pleasingly and appropriately carried out in the style of the old Spanish missions. This style, by reason of its simplicity, seems to be particularly acceptable to the Christian Scientists, who have also made excellent use of a modified version of the Romanesque style. Among California architects who are distinguishing themselves in these types of modern American church design, mention should be made of Irving J. Gill, Elmer Grey, and Myron Hunt.

**COMMERCIAL ARCHITECTURE.** Great promise for some future day is to be read in the steady and rapid advance of a new architectural mastery of the exigencies of utilitarian structures. Within the recollection of all of us is the time when no thought or effort was expended upon factories—it was assumed at the start that a factory *could* not be beautiful, or even decent to look at, and little effort was made to upset this theory because of the coexistent theory that there was no reason why a factory *should* be good looking, even if it were possible to make it so.

Let us make a brief survey of the following important types of "utilitarian architecture": office buildings, stores, factories, and power plants. The design of the tall office building, originated in this country, has been variously (and for the most part, excellently) met by the ingenuity and resourcefulness of American architects, who can point with justifiable pride to such achievements (in New York City) as the Bankers' Trust Building, City Investing Building, Trinity Building, Woolworth Building, Equitable Life Building, and Metropolitan Building.

The most important tall office building of 1916 in New York City is the Postal Life Building, on Fifth Avenue at 43rd Street, by York & Sawyer, who are distinguished for their ability in designs of this kind.

Mention should also be made of the Heckscher Building, on East 42nd Street, New York City, Jardine, Hill & Murdock, architects.

An important insurance building was completed for the Northwestern Mutual Life Insurance Co., in Milwaukee, Wis., by Marshall & Fox, of Chicago. These architects, with the firms of Graham, Burnham & Co., Holabird & Roche, and Pond & Pond, are the most prominent designers of large office buildings in the Middle West. In San Francisco, the firm of Willis Polk & Co. appears as designing a large proportion of bank and office buildings, and projects of the same nature in Boston, Mass., and Baltimore, Md., are largely the work of Parker, Thomas & Rice, who have offices in both cities. This firm has completed, in the past year, an important office building for Public Service, in Baltimore. So many large office buildings are

erected yearly in New York City that many firms of architects engage a large part of their time in this kind of work. To chronicle the year's buildings, however, in the present compass, would be impossible.

Nearly all the larger merchants in New York City had rebuilt their stores in magnificent scale on Fifth Avenue prior to 1916, but each year sees the erection of a great many smaller stores and shops on Fifth Avenue, and on its immediate side streets, but here, again, a chronicle would be impossible. Suffice it to say that the New York shops are showing a high order of architectural expression in several styles, each vying with the other in conveying to the passer-by an impression of "smartness," prestige, and self-respect.

The past year in factory design has been a prolific one, and the impetus given to American industry by the European war has resulted in the erection of many new plants, as well as extensive additions to existing factories.

Among the latest of admirable designs for factories are those for several buildings for the great Sears-Roebuck Mail-Order Company. Some of these buildings are at Kansas City, Mo., others at Seattle, Wash., and all show the real architectural possibilities of the factory. George C. Nimmons, the architect of these and many other factory buildings, usually designs in a free and colloquial sort of brick-and-stone Tudor-Gothic, and often gives a fine dignity and a dominant note of *design* to his factories by insistence on a great, massive, square tower, with buttresses. The present buildings for Sears-Roebuck at Kansas City represent but one-eighth of the projected group—the whole, when completed, will offer one of the most interesting and instructive studies in the planning and designing of industrial buildings.

It is an encouraging fact that greater attention is being paid yearly to the *appearance* of the factory. Any visitor to Detroit will find much to interest him in this connection in observing the many recently completed automobile factories, and other machine plants. Although most of these great factories present exteriors almost entirely of window area, of metal sash, their mass-design has been so well considered that they have an "architectural" aspect entirely different from our earlier factories.

The Twin City Branch of the Willis-Overland Company, Mills, Rhines, Bellman & Nordhoff, architects, has the appearance of a castle, because of a well-designed tower and good general proportions, although its walls are almost entirely of glass.

Several recent factories of design well worthy of mention are those of Rogers & Co., Chicago, Ill. (Mundie & Jensen, architects); C. P. Kimball Mfg. Co., Chicago, Ill. (George C. Nimmons, architect), and the Liquid Carbonic Plant, also in Chicago (Nimmons & Fellows, architects). In the last named, a great tower is again seen to raise the entire building to the status of "architecture," and out of the status of "utilitarian building."

A Chicago (Ill.) printing plant has been imaginatively designed by Howard Shaw (a prominent local country house designer) in a distinctively mediæval vein which is unusually interesting, and seems not at all incompatible with utilitarian aims. Throughout the country an astonishing and highly gratifying improve-

ment is seen in the design of factories, warehouses, and other similar buildings.

On the Pacific Coast, the architectural firm of Willis Polk & Co. has demonstrated that power-houses, pumping-stations, gas and electric plants and the like, may also be graciously designed buildings, of Classic or Renaissance character. An awakened sense of civic beauty, and the relationship between architecture and civic values will become increasingly apparent as the years go on, and one is safe in predicting Mr. Polk's beautiful power-houses, which are now "beautiful exceptions," will become the general and usual type in many parts of the country.

**CLUBS.** Clubs and Fraternal Orders usually add a number of interesting buildings to each year's architectural output, and a few of the more noteworthy examples may be mentioned here.

Most notable, perhaps, is the new building for the Colony Club of New York on 62nd Street, east of Fifth Avenue, by Delano & Aldrich. This building takes the place of the previous home of the club (by McKim, Meade, & White) on lower Madison Avenue. The new building is of brick and Indiana limestone, and is designed in a vein combining certain Adam traits with certain others more suggestive of Georgian Colonial.

In a very different style, and for a club of very different nature, is the building on West 48th Street, by Harry Allan Jacobs, recently opened for the Friars' Club. Here the architect most appropriately based his design on a modified sort of mediæval, monastic Gothic. Grotesques are effectively used, and tall, pointed windows with leaded diamond panes contribute largely to the desired flavor of antiquity, both within and without.

Palatial clubs called "Athletic Clubs" in all the larger cities of the Middle West are now becoming an indispensable index of civic progress and enlightenment, and the past year has seen the opening of three, in addition to all those in operation prior to 1916.

The Minneapolis Athletic Club, of Minneapolis, Minn., was designed by Bertram & Chamberlain. The Missouri Athletic Club, of St. Louis, Mo., was designed by Wm. B. Ittner and G. F. A. Brueggeman, associated. The Detroit Athletic Club of Detroit, Mich., was designed by Albert Kahn and Ernest Wilby.

The most important country club opened for some time past is the South Shore Country Club, of Chicago, Ill., designed by Marshall & Fox. This is a club-house of vast extent and complex equipment, rising from the shores of Lake Michigan, twin towers and a bulk of building suggesting a large summer hotel. Luxurious and complete, it typifies the height of modern American country-club requirements.

**RAILROAD STATIONS.** The planning of modern railroad stations continues along the advanced lines of development which the last 10 years have evolved. As in school and hospital design, there are new and efficient solutions of problems involving ventilation and sanitation, as well as new forms for the superficial expression of design. It seems as though broad ramps, or slightly pitched run-ways, may eventually take the place of nearly all stairways in railroad station construction, as well as in many other types of building where large crowds of people

are in continuous motion. A ramp relieves much of the crowd-congestion resultant from stairways. Great promise of further and even more radical developments in the sane and pleasing design of all buildings intended for public use is to be read in the remarkable progress which the last three, four, or five years have witnessed.

**THEATRES, ETC.** The erection of buildings for the production of theatrical enterprises has been largely arrested by the ever-increasing popularity of the motion picture. This condition has naturally resulted in the development of "The Motion Picture Theatre," which may be a diminutive affair of less than twenty feet street frontage, or a large and elaborate theatre carried out with a great deal of "style" and considerable expenditure. A material frequently used is glazed terra cotta, plain or in polychrome matt glazes. Hundreds of motion picture theatres are now erected annually, and the observer will be able to note with gratification that many of the architectural solutions are by no means without merit.

Many inventions bearing upon problems of construction, many new manufactured building materials, and many new devices and inventions in the realm of efficient or harmonious equipment yearly make possible the performance of architectural work of constantly advancing merit, economy, and appearance. Many new needs have arisen in recent years, but all are being met or are a subject for earnest study by our indefatigable architects. Even those who, through ordinary observation, are sufficiently interested in the current architecture of their own country to look about them, should feel, at the close of each year, that there lies behind a tangible record of earnest effort and worthy achievement, and that there lies ahead unqualified promise of still better things, and of new opportunities for the ultimate expression of the best that American architecture can produce.

**ARCHITECTURE IN EUROPE.** For the most part the warring nations are at a standstill in the pursuit of their several constructive and creative arts, the present situation being but a continuation, with the additional aggravation of another year of war, of the conditions outlined in the *YEAR BOOK* for 1915.

*The Studio* (published in this country as *The International Studio*), English, continues to print its usual quota of interesting British country houses, under the heading "Recent Designs in Domestic Architecture," and unless the material is being drawn from the editorial files, it is evidence of anything but a serious suspension of architectural activity in England. As might well be supposed, the architects of England are now called upon extensively for the design of memorial monuments and tablets, which present the admirable qualities of serious dignity and sincerity which would be looked for under the circumstances.

**ARCTIC EXPLORATION.** See *POLAR RESEARCH, Arctic*.

**ARGENTINA.** A federal republic of southern South America. Argentina, or the Argentine Republic, is officially called *la República Argentina* or *la Nación Argentina*. The capital is Buenos Aires, coextensive with the Federal District.

**AREA AND POPULATION.** The republic consists of 14 provinces, 10 territories, and the

Federal district. Estimates of area differ considerably; the one which seems most acceptable is 2,987,356 square kilometers (1,153,417 square miles); a planimetric calculation made at the University of La Plata shows an area of 2,789,462 square kilometers (1,077,011 square miles). In recent years the population has rapidly increased, but greatly excessive estimates, as 9,000,000 and even 10,000,000, have appeared in print.

The census of June 1, 1914, showed a total population of 7,885,237 (about 6.84 per square mile), as compared with 3,954,911, the number returned by the census of 1895. It is estimated, however, that 30,000 Indians and 60,000 other persons were not included in the 1895 census. Of the 7,885,237 inhabitants in 1914, 5,527,285 were Argentines; this number includes children of foreign parentage born in the republic and 33,219 naturalized foreigners. Foreigners not naturalized numbered 2,357,952; of these, 777,845 were in the Federal district. Of the Argentines, males numbered 2,753,214, and females 2,774,071; foreign males numbered 1,473,809, and foreign females 884,143. The population of the States and the Federal district was 7,526,499; that of the territories, 358,738.

A 1915 estimate of the population places the total at 7,979,259, or about 6.92 per square mile. The estimate for the Federal district (that is, the city of Buenos Aires), with an area of about 72 square miles, was 1,594,170; Province of Buenos Aires, 2,155,118 (18.29 per square miles), Santa Fé, 922,406 (18.19); Córdoba, 598,545 (8.95); Entre Ríos, 423,100 (14.47); Corrientes, 365,434 (10.90); Tucumán, 348,582 (33.45); Mendoza, 296,553 (5.25); Santiago del Estero, 247,004 (4.46); Salta, 161,150 (3.34); San Juan, 130,412 (3.44); San Luis, 126,895 (4.37). The least populous divisions of the republic are the territories Tierra del Fuego (with 0.29 per square mile, as estimated in 1915), Chubut (0.27), Santa Cruz (0.08), and Los Andes (0.07).

Buenos Aires is the largest city of the Southern Hemisphere and, after Paris, the largest Latin city in the world. Its population June 1, 1914, was 1,560,163; as estimated Jan. 1, 1916, 1,598,571. The second Argentine city is Rosario, with an estimated population of 234,885 in February, 1916. The 1914 estimate for the city of Córdoba was 135,000; La Plata (1912), 106,382; Tucumán (1913), 78,695; Bahía Blanca, 75,000; Mendoza, 62,000.

The great war has sharply affected immigration and emigration. Immigrants and emigrants in 1913 were reported to number 302,047 and 156,829 respectively; in 1914, 182,659 and 221,008; the reported number of immigrants in 1915 was 86,166.

EDUCATION. Of the population over six years of age about one-half is illiterate. Primary instruction is free, secular, and nominally compulsory between the ages of six and fourteen. The population of school age in 1913 is stated at about 1,275,500, of whom about 804,000 were in school attendance. For secondary education, the Federal government maintains 30 colleges (about 8800 students); private institutions of the same grade number 38 (about 3200 students). Besides normal schools and industrial, commercial, and other special schools, there are five universities; national universities are those of Córdoba (founded 1613), Buenos Aires

(1821), and La Plata; the universities at Santa Fé and Tucumán are provincial. Of the universities, Buenos Aires has by far the largest attendance; the enrollment in its various faculties and affiliated schools was 8032 in 1914. There is no state religion, but the Roman Catholic Church receives government support. Civil marriage was established in 1884.

PRODUCTION. Agriculture and stock-raising are Argentina's principal sources of wealth. Various minerals, including petroleum, occur, but mining has not become of any great importance. The leading industrial business is meat-packing, in the River Platte region. Flour-milling shows a considerable development. Besides flour and preserved meats, the manufactures include butter, cheese, sugar, wine, quebracho extract, and textiles. It was reported in 1916 that on account of the great war manufactures, particularly textiles, were showing an especial increase.

The following table shows in hectares the reported area of the principal grain crops in the years 1914-15 and 1915-16, average for the 5-year period 1909-10 to 1913-14, and the percentage of the 1915-16 crop on the average crop for the 5-year period:

	Area in hectares			Percent- age
	1914-15	1915-16	5-year av.	
Wheat ...	6,261,000	6,645,000	6,495,744	102.3
Rye .....	92,800	85,600	84,308	249.5
Barley ...	169,850	174,500	93,035	187.6
Oats .....	1,161,000	1,038,000	969,714	107.0
Corn .....	4,203,000	4,018,850	3,524,850	114.0
Linseed ..	1,723,000	1,619,000	1,620,584	99.9

Below are shown the corresponding figures for production, in metric quintals:

	Production in metric quintals			Percent- age
	1914-15	1915-16	5-year av.	
Wheat ...	45,850,000	46,988,000	40,526,152	116.0
Rye .....	460,000	510,000	855,325	148.5
Barley ...	1,120,000	1,400,000	956,977	146.3
Oats .....	8,310,000	10,927,000	8,118,186	134.6
Corn .....	85,916,450	40,930,000	48,694,000	84.1
Linseed ..	11,255,000	9,974,000	8,018,584	124.4

Other important products are alfalfa, potatoes, sugar cane, and wine. The government is encouraging the cultivation of rice and yerba maté. Of the latter, immense quantities are imported from Paraguay and especially from Brazil. Reported wine production in 1915, 4,823,475 hectolitres; of this, 80.4 per cent was produced in the Province of Mendoza and 16.7 per cent in San Juan. In the production of linseed Argentina ranks first among the countries of the world. See COTTON.

A recent live stock estimate is as follows: horses, 9,700,000; mules, 580,000; asses, 340,000; cattle, 29,500,000; sheep, 80,000,000; goats, 4,500,000; swine, 3,050,000. Returns published in 1916 of a live stock census of Buenos Aires province showed 3,371,179 horses, 11,336,513 cattle, 18,528,641 sheep, and 1,324,408 swine; as compared with the live stock census of 1908, horses showed an increase of 851,226, cattle 985,278, swine 613,167, and sheep a decrease of 16,076,151.

COMMERCE. In 1914 and 1915 imports amounted to \$263,663,363 and \$220,085,951 respectively; exports, \$338,776,517 and \$541,532,224. In 1914 there was a very great decline in foreign trade, due both to domestic economic

conditions and to the great war. About the beginning of 1915 trade began to adjust itself to the changed conditions caused by the war; imports continued below the normal of peace times, and exports above the normal, the latter case being due in part to increase of prices. Valued in thousands of pesos gold, imports and exports have been as follows:

	1905	1910	1913	1914	1915
Imports	205,154	351,771	421,353	271,818	226,893
Exports	322,844	372,626	483,505	349,254	558,281

Principal classified imports, in thousands of pesos gold, in 1914 and 1915 respectively: textiles and manufactures thereof, 52,517 and 51,935; oils, grease, etc., 20,053 and 36,140; food products, 23,324 and 22,556; earths, stone, glass, coal, etc., 28,847 and 19,890; iron and steel and manufactures thereof, 35,158 and 18,646; building materials, 17,935 and 11,935; chemicals and pharmaceutical products, 11,110 and 10,590; railway cars, equipment, carriages, automobiles, etc., 22,959 and 6798; wines, liquors, and other beverages, 8131 and 6562; agricultural implements and machinery, 3239 and 6547; tobacco, 5908 and 6145; metals (other than iron and steel) and manufactures thereof, 7648 and 5870; paper and manufactures thereof, 7421 and 5823.

Exports as classified under six general heads are shown below, in thousands of pesos gold:

	1912	1913	1914	1915
Live animals and meat products	188,216	165,800	151,746	218,780
Agricultural products	278,187	301,267	184,367	312,884
Forest products	8,983	10,618	9,239	19,012
Mining products	285	195	84	180
Hunting and fishing	2,608	1,817	1,320	2,045
Miscellaneous	2,712	3,808	2,498	5,380
Total	480,391	483,505	349,254	558,281
Value in thousands of dollars	465,980	468,999	338,777	541,532

Imports and exports of coin and bullion (not included in the foregoing figures) were 4,200,517 and 6346 pesos respectively in 1915.

Imports by principal countries, in thousands of pesos gold:

	1912	1913	1914	1915
United Kingdom	118,669	130,887	92,475	67,782
United States	59,127	62,083	36,684	56,159
Italy	32,487	34,790	24,872	21,168
Mexico	14	1,854	1,791	15,118
France	37,619	38,076	22,394	13,811
Spain	11,928	12,390	8,604	11,339
Brazil	9,547	9,259	9,290	10,382
Germany	63,942	71,812	39,996	5,653
Paraguay	2,128	2,271	1,789	2,260
Sweden	2,291	3,124	1,884	2,062
Netherlands	3,442	4,074	2,801	1,981
Uruguay	2,497	8,196	2,932	1,880
Total, including other	384,853	421,353	271,818	226,893
Value in thousands of dollars	373,308	408,712	263,663	220,086

Exports by principal countries, in thousands of pesos gold:

	1912	1913	1914	1915
United Kingdom	121,873	120,368	102,149	164,972
United States	32,391	22,894	42,867	89,843
Italy	21,148	20,039	8,549	40,939
France	36,052	37,719	19,972	40,356
Brazil	22,646	24,309	15,708	21,905
Netherlands	16,027	32,624	11,173	18,831
Uruguay	4,714	6,301	4,718	7,957

	1912	1913	1914	1915
Spain	3,582	4,818	2,405	7,142
Sweden	1,496	1,074	1,675	5,021
Australia	.....	.....	127	4,972
Germany	58,995	57,916	30,731	.....
Belgium	37,258	32,732	17,506	.....
Austria-Hungary	2,897	3,246	1,377	.....
For orders*	114,904	117,716	82,624	143,137
Total, including other	480,391	483,505	349,254	558,281
Value in thousands of dollars	465,980	468,999	338,777	541,532

\* The exports "for orders" are not recorded at Argentine ports as for specific countries, but are subject to cable or other orders for final destination.

The effect of the great war on shipping entered and cleared at Argentine ports is very marked. In 1913, foreign tonnage entered and cleared was 27,007,000 (metric); in 1915, 18,866,000. In 1913, nearly 92 per cent of the foreign tonnage was under the flags of the now belligerent nations; in 1915, about 70 per cent. British shipping entered and cleared in 1913 and 1915 respectively was 18,433 and 11,094 thousand tons; Dutch, 446 and 1494; Italian, 1444 and 1148; Norwegian, 498 and 1023; French, 1182 and 775; Spanish, 430 and 755; Greek, 74 and 556; American, 27 and 499; Belgian, 347 and 269; German, 2840 and 16.

COMMUNICATIONS. In length of railway, Argentina ranks first among Latin-American countries and ninth among the countries of the world. The reported length of railway in operation in 1915 was 22,688 miles, of which 4136 miles belonged to the state. The electric service on the Argentine Central Railway, between the two stations of Retiro and Tigre, was inaugurated during 1916. This line was proposed in 1910 and after the consent of the government had been obtained orders for the machinery, rolling stock, and equipment were placed in 1913. The line is about 17 miles long, and the third rail system is used. The rolling stock, only a portion of which had arrived in Argentina owing to the war, was to consist of 105 coaches—of which but 72 had been received—50 trailer coaches and 55 motor coaches.

Telegraph lines (1915), 43,153 miles (of which, national lines 23,978 miles), with 131,586 miles of wire. Radiotelegraph stations, 12. Post offices (1915), 3365.

FINANCE. The monetary unit is the peso (gold), equivalent to 5 francs, or 96.475 cents. Under the conversion law of 1899, the paper peso is current with a value of 44 per cent of the monetary unit, or 42.449 cents. For 1915 and for 1916, the budget showed estimated revenue of 393,230,564 pesos paper—322,554,626 ordinary and 70,675,938 extraordinary. The estimated expenditure according to the 1915 budget was 392,818,501 pesos paper—322,142,563 ordinary and 70,675,938 extraordinary. For 1916, the budget showed estimated expenditure of 352,930,871 pesos paper—307,142,079 ordinary and 45,788,792 extraordinary. Import duties constitute nearly one-half of the estimated ordinary revenue. Other important sources of revenue are tobacco, spirits, land tax, stamps, and port dues. In the 1916 budget, the larger estimated ordinary expenditures were: for public debt, 88,738,069 pesos paper; justice and education, 60,171,637; interior, 47,332,181; army, 26,059,327; navy, 22,121,033; treasury, 17,287,803; pensions, etc., 14,250,006;

agriculture, 11,462,008; public works, 7,350,804. The estimated extraordinary expenditure included 33,538,254 pesos paper for public works. The government's gold reserve on Sept. 1, 1916, was reported at 316,827,643 pesos; against this reserve, paper, nickel, and copper money in circulation totaled 1,013,081,058 pesos.

**ARMY.** The army of Argentina in 1916 came in for more than its usual share of interest for the reason that attention was directed to the scheme of universal service in force, as well adapted to a republic and especially to American conditions. At the same time critics in Argentina were by no means convinced that the military laws were the best possible inasmuch as features of French and German statutes or regulations had been taken that were not applicable to Argentine conditions. According to the law of September 28, 1905, as subsequently amended, personal military service in Argentina is obligatory on every citizen from 20 to 45 years of age, one year of the first period of service being spent with the colors, 10 years in the national guard, and 5 years in the territorial guard. With universal service the men of military age are trained and divided into 8 classes for the army of the line, which has an effective strength of 170,000. Of these 138,000 have received military training of from 3 months to 2 years. An effective strength of 215,000 was claimed for the national guard, of which 100,000 had received military training. It was estimated that Argentina could raise on mobilization an army of about 260,000 men of from 20 to 40 years of age. In 1916 considerable difficulty was experienced on account of the large number of illiterates, and in the *Resista Militar* for May it was stated that 5730 of 13,700 men incorporated in the last conscription were illiterate, so that there was involved the problem of adjusting the training to their various capacities. A change in the law was demanded so as to diminish the time of service for the more intelligent and increase it for the illiterate. Compulsory service in Argentina has had the effect of assimilating the foreign born, who form a large portion of the population, and the army is said to be the institution that has contributed most highly to the state. The actual organization of the army was provided by the law of 1913 and in times of peace consists of a permanent army of 6 generals of divisions, 12 generals of brigades, 70 colonels, 150 lieutenant colonels, 200 majors, 320 captains, 220 first-lieutenants, 300 lieutenants, 144 sub-lieutenants, and 20,000 men. On a peace footing there are five divisions, comprising 20 regiments of infantry, 9 regiments of cavalry, 5 regiments of field artillery, 1 regiment of field howitzers, 2 groups of mountain artillery, 1 battery of horse artillery, 1 battery of siege artillery, 1 machine gun battalion, 5 battalions of engineers, and the requisite supply, medical, and technical troops.

**NAVY.** The navy includes: 2 old coast guards (1890 and 1891), aggregating 4600 tons; 1 old coast guard (1880), 4200 tons; 4 armored cruisers, *Garibaldi* (1896), *San Martin* (1897), *Belgrano* (1898), *Pueyrredon* (1898), aggregating 27,400 tons; 3 protected cruisers (1890 to 1895), 11,620 tons; several torpedo-boat destroyers, torpedo boats, river gunboats, etc. Besides the foregoing vessels Argentina possesses two

dreadnoughts, the *Rivadavia* and the *Moreno*, both launched in 1911, the former at Quincy, Mass., and the latter at Camden, N. J.; each displaces about 28,000 tons, and has a main battery of 12 12-inch guns and a speed of 22.5 knots.

**GOVERNMENT.** The executive authority is vested in a president, who, with a vice-president, is elected for six years by indirect vote and is ineligible for the next term; he is assisted by a responsible ministry of eight members. The legislative power is exercised by a congress of two houses, the Senate and the Chamber of Deputies. Senators (30 in number, 2 from each province and from the Federal district) are elected for nine years by the provincial legislatures and, in the Federal district, by a special body of electors. Deputies (120) are elected by direct vote for four years. For the term ending Oct. 12, 1916, Roque Sáenz-Peña was elected president, in succession to Figueroa Alcorta. Sáenz-Peña died Aug. 9, 1914, and the vice-president, Victorino de la Plaza, assumed the executive office. On Oct. 12, 1916, Hipólito Irigoyen was inaugurated president, and Pelagio Luna vice-president, for the six-year term.

**HISTORY.** On July 9th President Victorino de la Plaza narrowly escaped death at the hands of an anarchist, who attempted to assassinate him while he was reviewing the troops from a government building in Buenos Aires. The nomination for president was offered to Dr. Hipólito Irigoyen on Mar. 22nd. Upon his declining it the Radical party at its national convention voted unanimously against accepting his refusal, whereupon Dr. Irigoyen consented to become a candidate. He was elected president, with Don Pelagio Luna as vice-president, by the electoral college on June 12th, receiving 152 votes out of 298 after an extremely bitter political campaign. He was the first Radical chosen to that office. During the campaign there were disturbances in the provinces, which caused the national government to intervene, and to establish military authority. Congress ratified the presidential election on July 20th. This was the first election held under the law introducing minority representation, the *scrutin de liste*, and the secret obligatory vote.

**ARIADNE AUF NAXOS.** See MUSIC, Germany.

**ARIZONA. POPULATION.** The estimated population of the State at the end of 1916 was 259,666. The population in 1910 was 204,354.

**AGRICULTURE.** The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture in 1915-16 were as follows:

		Acreage	Prod. Bu.	Value
Corn	.....1916	22,000	770,000	\$1,078,000
	.....1915	20,000	600,000	690,000
Wheat	.....1916	40,000	1,160,000	1,740,000
	.....1915	39,000	1,092,000	1,256,000
Oats	.....1916	9,000	338,000	270,000
	.....1915	9,000	333,000	218,000
Barley	.....1916	32,000	1,120,000	1,210,000
	.....1915	35,000	1,295,000	725,000
Potatoes	.....1916	1,000	115,000	207,000
	.....1915	1,000	95,000	95,000
Hay	.....1916	165,000	627,000	9,092,000
	.....1915	147,000	a 470,000	4,512,000

a Tons.

**MINERAL PRODUCTION.** The output of gold, silver, copper, lead, and zinc in the State in

1915 was valued at \$90,600,349, an increase of nearly 40 per cent over 1914. The increases are especially noteworthy in lead and zinc, the great change in the prices of these metals making this nearly \$26,000,000 in copper, \$400,000 in lead, and over \$200,000 in zinc. The output of gold increased slightly, but the production of silver surpassed all previous records. It amounted to 5,649,020 ounces, a gain of nearly 25 per cent over 1914. Arizona is the leading copper-producing State, and had an output for 1915 of nearly 460,000,000 pounds, an increase over the previous year of nearly 57,000,000 pounds, and in value nearly \$26,000,000. The output of lead increased 22,272 pounds in 1915, or over 48 per cent. The production of zinc increased to 17,729,000 pounds, or over 21 per cent. During the year deposits of quicksilver were discovered in the Mazatzal range. The development has not progressed to a point which would indicate the practical value of these deposits.

The output of gold, silver, copper, lead, and zinc in the mines of the State in 1916 had a total value of nearly \$203,000,000, according to the estimates of the United States Geological Survey. This is the record production of the State, and may be compared with the value of \$90,600,349 in 1915. The notable output of copper and the high price of metals assisted in this increase of 123 per cent. The production of gold increased from \$4,166,025 in 1915 to approximately \$4,427,000 in 1916, an increase of over 6 per cent. The production of silver increased from 5,649,020 ounces in 1915 to a record of about 6,823,000 ounces in 1916. As the market value was much higher, the value increased from \$2,864,053 to nearly \$4,490,000, or nearly 51 per cent. The mined output of copper surpassed all records and previous estimates. It increased from 459,972,295 pounds in 1915 to approximately 693,000,000 pounds in 1916. The value of the output increased from \$90,495,252 to nearly \$190,000,000, or 135 per cent. The mined output of lead increased from 21,738,969 pounds in 1915 to a record production of over 26,000,000 pounds in 1916, and the value increased from \$1,021,732 to \$1,768,000, or 73 per cent. The production of zinc increased from 18,220,863 pounds in 1915, valued at \$2,259,387, to about 20,980,000, valued at \$2,874,260, in 1916, an increase of nearly 27 per cent in value.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in so far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments . . . . .	311	322
Average number of wage earners . . . . .	6,441	6,898
Capital invested . . . . .	\$32,873,000	\$40,300,000
Wages . . . . .	5,595,000	6,229,000
The value of materials used . . . . .	33,600,000	39,283,000
The value of products . . . . .	50,257,000	64,090,000

**TRANSPORTATION.** The railway mileage of the State on June 30, 1915, was 2989. The railways having the longest mileage are the Atchison, Topeka, and Santa Fe, 1159; Southern Pacific, 682; Arizona Eastern, 448; and the El Paso and Southwestern, 349.

**FINANCE.** The latest figures available for

the financial condition of the State are for 1914. At the beginning of that fiscal year there was in the treasury a balance of \$1,034,183. The receipts for the year amounted to \$2,770,571, and the disbursements to \$3,051,356, leaving a balance of \$703,298 at the end of the year. The bonded debt of the State amounted to \$3,500,000.

**EDUCATION.** The total school population of the State in 1916 was 57,259. There were enrolled in the public schools 47,945 pupils. The average daily attendance was 31,812, and in the high schools 2244. The male teachers numbered 202, and the females 1162. The average monthly salary of male teachers was \$114.18, and females \$87.86.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions of the State with their population in 1916 were as follows: State Hospital for the Insane, 487; Arizona State Prison, 376; Home for the Aged and Infirm Arizona Pioneers, 42; State Industrial School, 66.

The most notable feature of the administration of these institutions during the fiscal year 1916 was the effect of prohibition on the prison population. The population of the prison on June 30, 1914, at which time the sale of intoxicating liquors was legalized, was 436. For the fiscal year ending June 30, 1916, which was the first fiscal year entirely free from intoxicating liquors, the population was 329. During the fiscal year ending June 30, 1914, there were received in the State prisons from the courts 289 prisoners, while during the fiscal year ending June 30, 1916, there were received 195 prisoners. Prior to the inauguration of prohibition the prison population was increasing annually.

**POLITICS AND GOVERNMENT.** The campaign in Arizona resulted in one of the surprises which distinguished the presidential campaign of 1916. The State has been normally Democratic since its admission to the Union, and it continued its tradition in casting its vote for President Wilson by a considerable plurality, while it elected by a plurality of only 32 votes, a Republican Governor. The national campaign was not pressed with great vigor by the Democrats. W. J. Bryan made speeches, as did Senators Owen and Gore of Oklahoma. The Senators from the State also took an aggressive part in the campaign. The most distinguishing feature from the Republican side was the visit of Colonel Roosevelt in October. He made an address at Phoenix, in which he severely criticised the administration on its course in Mexico. The candidates for Governor were George W. P. Hunt, Democrat, who had been Governor of the State since its admission, and Thomas E. Campbell, Republican. The final vote was 27,978 votes for Campbell, and 27,946 for Hunt. For United States Senator Henry F. Ashurst received 29,873 and Joseph H. Kibbey 21,261. The State officers with the exception of Governor are all Democratic. The vote for President was 33,170 for Wilson, 20,524 for Hughes. A number of amendments were voted on, and the most important of them were carried. An initiative and referendum amendment was carried by a vote of 18,356, for, to 13,561, against. The amendment for prohibition was carried by a vote of 28,473, for, to 17,379, against. An amendment providing for work-



men's safety was defeated. An amendment abolishing the State Senate was also defeated. An amendment abolishing the death penalty was carried by a small majority. An amendment creating a Department of Labor was defeated, as was also the amendment creating the office of State architect. An amendment providing for absolute divorce was also defeated.

President Wilson in June signed a proclamation excluding 558,520 acres from the Dixie National Forest. Three-fourths of this area are subject to settlement under the Homestead laws from July 12th to and including August 8th, and thereafter to disposition under any public land law which applies to them. The excluded lands lay in the northwestern part of the State, and are valuable chiefly for grazing purposes.

The decision of the Superior Court of the State which held that under the Webb-Kenyon Act liquor could not be lawfully brought into the State even for personal use, was set aside in April by the Supreme Court of the State, which held that the judge of the Superior Court erred in his decision and that "it is not unlawful in Arizona to have or to personally use intoxicating liquors."

**STATE OFFICERS.** Governor, Thomas E. Campbell, Republican; Secretary of State, Sidney P. Osborn; State Auditor, Jesse L. Boyce; State Treasurer, David F. Johnson; Attorney-General, Wiley E. Jones; Superintendent of Public Instruction, C. O. Case; Corporation Commissioner, Amos A. Betts; State Mine Inspector, G. H. Bolin.

**JUDICIARY.** Supreme Court: Chief Justice, Alfred Franklin; Associate Justices, D. L. Cunningham, Henry D. Ross; Clerk, Clay F. Leonard.

STATE LEGISLATURE.

	Senate	House	Joint Ballot
Democrats .....	14	31	45
Republicans .....	5	4	9
Democratic majority..	9	27	36

**ARIZONA, UNIVERSITY OF.** A co-educational State institution at Tucson, Arizona, founded in 1885. It comprises a College of Agriculture, a College of Mines and Engineering, and a College of Letters, Arts, and Science, the total number of students in the autumn of 1916 being 492. In the faculty were 65 members. Mining interests of the State have lately given \$100,000 to be added to a \$75,000 State appropriation for the erection of a mines and engineering building. An observatory will be built and equipped through a gift of \$60,000, so far anonymous. The university receives \$90,000 annually from the Federal government and for the biennium 1915-17 was granted \$537,028 by the State. In addition, it has in productive funds \$167,223 and in income \$6688. There are 25,000 volumes in the library. President, R. B. Von Kleiss Smid.

**ARKANSAS. POPULATION.** The estimated population of the State at the end of 1916 was 1,753,033. The population in 1910 was 1,574,449.

**AGRICULTURE.** The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn .....	2,550,000	45,185,000	\$44,232,000
..... 1915	2,700,000	62,100,000	89,744,000
Wheat .....	255,000	2,040,000	3,825,000
..... 1915	220,000	2,750,000	2,778,000
Oats .....	350,000	7,350,000	4,998,000
..... 1915	375,000	10,125,000	5,265,000
Rice .....	125,000	6,312,000	6,060,000
..... 1915	100,000	4,840,000	4,598,000
Potatoes ...	25,000	1,625,000	3,088,000
..... 1915	28,000	2,520,000	3,022,000
Hay .....	375,000	469,000	5,862,000
..... 1915	350,000	a 560,000	5,768,000
Tobacco ...	500	250,000	50,000
..... 1915	500	b 300,000	51,000
Cotton .....	2,635,000	1,145,000	107,430,000
..... 1915	2,150,000	c 785,000	43,590,000
Rye .....	1,000	10,000	12,000
..... 1915	1,000	10,000	10,000

a Tons. b Pounds. c Bales of 500 pounds gross weight.

**MINERAL PRODUCTION.** The coal production in the State in 1915 was 1,652,106 short tons, valued at \$2,950,456, compared with 1,836,540 short tons, valued at \$3,158,168, in 1914. About 70 per cent of the total of the State is produced in Sebastian County. This county, however, showed a decrease in 1915 whereas all other counties showed increases. There were 3751 men employed in and about the coal mines in 1915.

The lead and zinc mined in the State in 1915 was valued at \$801,754, compared with \$65,214 in 1914. The shipments of zinc carbonate in 1915 amounted to 7925 tons, valued at \$408,079, an increase of 700 per cent in quantity and 1500 per cent in value over 1914.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments...	2,925	2,604
Average number of wage earners .....	44,982	41,979
Capital invested .....	\$70,174,000	\$77,162,000
Wages .....	19,113,000	20,752,000
The value of materials used..	34,935,000	44,907,000
The value of products .....	74,916,000	83,940,000

**TRANSPORTATION.** The total railway mileage of the State is 5400 miles.

**FINANCE.** The report of the State treasurer for the fiscal year 1916 shows total receipts from all sources \$3,961,075, disbursements \$3,728,016, balance \$254,055. The chief sources of revenue are direct tax. The chief expenditures were for schools, Confederate pensioners, charitable institutions, and for officers' and employees' salaries. The bonded debt of the State was \$1,250,500.

**EDUCATION.** The total school population of the State in 1916 was 649,083. The total enrollment in the public schools was 437,953, and the average daily attendance was 283,566. There were 4982 male teachers, and 6080 female teachers. The average monthly salary for male teachers was \$65, and for female teachers \$50.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions of the State include the State Hospital for Nervous Diseases at Little Rock, the Deaf Mute Institute at Little Rock, School for the Blind at Little Rock, the Confederate Soldiers' Home at Sweet Home, the Arkansas State Penitentiary and State Farm,

and the Arkansas State Reform School at Little Rock.

**POLITICS AND GOVERNMENT.** There was no meeting of the Legislature in 1916, as the sessions are biennial, and the last was held in 1915. There were three candidates for the Democratic candidacy for Governor, Dr. Charles H. Brough, formerly of the Chair of Political Economy at the University of Arkansas, Earl W. Hodges, former Secretary of State, and L. C. Smith, formerly sheriff and county judge. Dr. Brough received the nomination. The Republicans nominated Wallace Townsend, lawyer, of Little Rock. In the vote for Governor, Brough received 122,041 votes, and Townsend 43,965. United States Senator James P. Clarke, who was serving his third term, died on October 1st. There was no time to hold the Democratic primaries for the election of November 7th, and the Democratic State Central Committee nominated William F. Kirby, of the Supreme Court. His opponent was H. L. Rimmel, Republican national committeeman from Arkansas. The State elections were formerly held in September, but the Legislature of 1915 passed a measure consolidating the State and national elections. Mr. Kirby was elected United States Senator, by a vote of 110,293 to 48,922 for his Republican opponent. In the voting for President, President Wilson received 112,282, Mr. Hughes, 47,135 votes. Two important proposed acts and three proposed constitutional amendments were submitted to the voters through the initiative. Act. No. 1 was a proposed new primary election law. It was adopted by a vote of 93,790 to 46,696. Act. No. 2 proposed to substitute a local option law for the State-wide prohibition measure which was passed by the Legislature of 1915. It was defeated by a vote of 109,697 to 58,064. A constitutional amendment, No. 12, proposed to give school districts the right to increase the local school tax from 7 to 13 mills. It was adopted by a vote of 108,173 to 52,175. Amendment No. 13 proposed a new referendum and initiative to take the place of the present measure. The general argument against it was that it was too radical. The measure provided among other things that no law adopted by the people could be regarded as unconstitutional, except by a unanimous vote of the supreme court. This measure was defeated by 73,782 to 69,817. Another initiative and referendum has already been drafted which is designed to remove the serious objections that were urged against the one defeated. Amendment No. 14 would have authorized counties to vote the present three-mill record tax for periods as long as 30 years instead of two years as now, so that bonds might be issued against the revenue thus provided for. The amendment received 82,703 votes to 67,656 against it, but failed adoption because it lacked about 5000 votes of the majority of all those cast in the election which the constitution requires.

**OTHER EVENTS.** On February 6th, the flood waters of the Arkansas River broke the levees, and flooded a number of towns in the southeastern part of the State. Sixteen lives were lost, several thousands of persons were made homeless, and damage was done to the extent of several hundreds of thousands of dollars. The Arkansas City water rose 15 feet above the level of the town on one side, and on the other side formed a great lake about 40 miles long and about 20 miles wide.

**STATE OFFICERS.** Governor, Charles H. Brough; Secretary of State, T. J. Terral; Treasurer, Rufus G. McDaniel; Auditor and Insurance Commissioner, Hogan Oliver; Attorney-General, J. D. Arbuckle; Superintendent of Education, J. L. Bond; Commissioner of Agriculture, J. H. Page; Commissioner of Public Lands, W. B. Owen — all Democrats.

**JUDICIARY.** Supreme Court: Chief Justice, Edgar A. McCulloch; Justices, F. G. Smith, C. D. Wood, T. Hayden Humphreys, and Jesse C. Hart; Clerk, P. D. English.

**STATE LEGISLATURE.** Almost wholly Democratic.

**ARKANSAS, UNIVERSITY OF.** A co-educational State institution founded in 1871 at Fayetteville, Arkansas. In the fall of 1916 there were 814 students and 70 instructors. The productive funds amounted to \$130,000 and the total income from all sources to about \$236,000. The library contains 25,500 volumes. President, John Clinton Futrall.

**ARMENIAN MASSACRES.** See TURKEY.

**ARMENIAN RELIEF.** See RELIEF FOR WAR VICTIMS.

**ARMIES.** See MILITARY PROGRESS and section *Army* under the various countries.

**ARMOR.** See BATTLESHIPS.

**ARMORED CARS.** See MILITARY PROGRESS.

**ARMORED SHIPS.** See BATTLESHIPS.

**ARNOLDSON, KLAS PONTUS.** A Swedish author and peace advocate, died in Stockholm, Feb. 20, 1916. He was born at Göteborg in 1844 and was largely self-educated. From 1871 to 1881 he was in the service of the state railways. During this time he became prominent by his writings in support of rationalistic philosophy and as a publicist. As a member of the Riksdag from 1882 to 1887, he advocated permanent neutrality for the Scandinavian countries. By founding the Swedish Society for Peace and Arbitration he made himself a leader in the world peace movement. Other public causes that gained his support were those of religious freedom, women's rights, and social betterment. In 1908 the Nobel peace prize was divided between Arnoldson and M. F. Bajer of Denmark, Arnoldson devoting his share of the money to the cause of peace. He edited several periodicals and wrote much besides, publishing as his most important work *Seklernas hopp: en bok om världsfreden* (*The Hope of the Centuries: a Book on World Peace*), which appeared in 1900 and was translated into English, French, German, and Norwegian.

**ART EXHIBITIONS.** See PAINTING AND SCULPTURE.

**ARTHOPODS.** See ZOOLOGY, *Arthropods*.

**ARTILLERY.** See MILITARY PROGRESS.

**ARTS.** See ARCHITECTURE; DRAMA; MUSIC; PAINTING AND SCULPTURE.

**ART SALES.** See PAINTING AND SCULPTURE.

**ASCALOSI, ALESSIO, CARDINAL.** See ROMAN CATHOLIC CHURCH.

**ASHLEY, CLARENCE DEGRAND.** An American legal scholar and educator, died in New York City, Jan. 26, 1916. He was born in Boston in 1851, graduated from Yale in 1873 and in law from Columbia in 1880, meanwhile having studied for two years also in Berlin. After practicing law for some years, he organized in 1891, and was a professor in, the Metropolis Law School. When, four years later, this school was merged with the New York University Law

School, Professor Ashley became professor of law in the latter, and also vice dean and then acting dean; and in 1896 he added to his duties as a teacher those of dean. In this post he remained till his death. From 1899 to 1910 he also lectured at Bryn Mawr College. Early an advocate of the teaching of law by the case system, and a promoter, through the Woman's Law Class of the New York University Law School, of legal education for women, Dean Ashley published, in the field to which he devoted most attention, *Cases on Contract* (1899, 1912), *The Law of Contracts* (1911), and articles in legal journals.

**ASHURST, HENRY FOUNTAIN.** Reflected Democratic United States Senator from Arizona, Nov. 7, 1916.

**ASIA.** See articles on the various Asiatic countries; also **EXPLORATION**.

**ASPHALT.** The natural asphalt of all kinds sold in the sources of production in the United States in 1915 aggregated 75,751 short tons, valued at \$528,490, a decrease of 4137 tons, or 5 per cent in quantity, and \$15,633, or 2 per cent in value, from the production and value of 1914. The sales of manufactured asphalt in 1915 were 604,553 short tons, valued at \$4,715,583. This was obtained from petroleum of domestic origin. An increased amount was manufactured during the year for petroleum imported from Mexico. There were in 1915 39 plants manufacturing asphalt. The States producing natural asphalt were California, Kentucky, Oklahoma, Texas, and Utah. Utah in 1915 was the largest producer, and was followed by Kentucky. The asphalt imported in the United States in 1915 was 138,252 short tons valued at \$680,357. The principal use of asphaltic metal in the United States is for highway and pavement construction and maintenance. The asphalt industry in other countries was seriously affected in 1915 by the war in Europe. The amount exported to Europe from Trinidad in 1915 was 18,025 tons, compared with 75,297 tons in 1914. The exports to the United States, however, increased greatly. Trinidad is the largest producer of asphalt. Other countries producing large quantities are Venezuela, Cuba, and Canada.

**ASPHYXIATING GASES.** See **CHEMISTRY, INDUSTRIAL**.

**ASQUITH, HERBERT HENRY.** See **GREAT BRITAIN, History**; **WAR OF THE NATIONS**.

**ASSOCIATION OF UNIVERSITY PROFESSORS, AMERICAN.** See **UNIVERSITIES AND COLLEGES**.

**ASTHMA.** See **VACCINE THERAPY**.

**ASTOR, WILLIAM WALDORF.** A British capitalist, formerly an American citizen. He was created Baron Astor of Hever Castle by King George V Jan. 1, 1916.

**ASTRONOMY.** During 1916 the European observatories reported a continued diminution of activity, owing in many cases to the withdrawal of members of their staffs for war service. The American observatories, on the other hand, maintained their high level of productive research, the Mount Wilson Solar Observatory leading in the variety and importance of its contributions to astronomical science. The total solar eclipse of February 3rd passed almost unobserved. A new "runaway" star having a greater proper motion than any previously known was discovered by Professor Barnard. Encke's Comet was again observed at Heidelberg in September

when barely a month had elapsed from the time of its passage through aphelion, and three new comets were detected; none of the periodic comets due to return during the year was observed. An important event of the year was the dedication of the new Van Vleck Observatory of Wesleyan University, Middletown, Conn. The death roll of the year included the names of Oskar Backlund, director of the Imperial Russian Observatory at Pulkova, distinguished for his researches on the period of Encke's Comet; William Frederick King, chief astronomer of the Canadian government, and superintendent of the Geodetic Survey of Canada; Friedrich J. C. Krüger, director of the Aarhus (Denmark) Observatory, well known for his work on colored stars; Percival Lowell, founder and director of the Lowell Observatory at Flagstaff, Arizona, famous for his observations of the planet Mars; Mauryc Rudzki, director of the observatory at Cracow, and the author of numerous contributions to geophysics and seismology; and Karl Schwarzschild, director of the Potsdam Astrophysical Observatory, distinguished for his theory of radiative equilibrium of the sun, and his ellipsoidal hypothesis of stellar motions, and for other important contributions to astronomy and physics.

**MOUNT WILSON SOLAR OBSERVATORY.** The results obtained at this observatory during 1915 were briefly summarized under 78 heads by Prof. George E. Hale, the director of the observatory, in his annual report. Among the most important may be mentioned the following: The testing, both by solar observations and by laboratory experiments, of the tentative working hypothesis of sunspots, first proposed in 1912. A series of photographs was obtained showing the various phenomena of the Zeeman effect more perfectly than ever before. The continuation of the observations on the Stark effect gave positive results, but the indications are that the sun's general electric field is not more than 200 volts per centimeter at the hydrogen level. The conclusion was reached that, if anomalous refraction has any influence on the positions of the Fraunhofer lines, it must be of the second order, no correspondence being found between the solar phenomena and the degree of anomalous dispersion observed in the laboratory. The equatorial value of the sun's rotation was found to have undergone a progressive diminution when compared with the results obtained in former years. Much work on nebulae and star clusters was accomplished, 23 new variables being discovered in the globular cluster Messier 3, thus bringing the total number in that cluster to 155; and 5 new variables were found in the cluster Messier 13. The magnitudes and colors of more than 1000 stars in the latter cluster were catalogued, and a similar catalogue was made for 300 stars in the open cluster Messier 37. In the case of M13, 70 per cent of the 400 brightest stars were found to be redder than the normal solar star, while 85 per cent of the 400 faintest stars were found to be bluer. The radial velocities of 500 stars were published during the year; for four of these, the surprisingly large values of 114, -290, -148, and -179 kilometers per second were obtained; and generally stars of very low absolute luminosity, and probably of small mass, were found to have exceptionally high radial velocities. The radial velocity of approach of the Andromeda nebula was calculated to be equal to 329 kilometers per

second, while the bright-line nebula N. G. C. 1068 was determined to be retreating in the line of sight with the great velocity of 765 kilometers per second. The spectrum of Nova Geminorum No. 2, discovered by Enebo in 1912, was under observation, and changed during the year from the type characteristic of a planetary nebula to that of a Wolf-Rayet star. Success attended the work of determining the absolute magnitudes of stars, and hence their individual parallaxes, from the relative intensities of certain lines in their spectra. Considerable progress on the 100-inch telescope was reported. The dome was finished and more than 85 per cent of the work of parabolizing the great mirror was done, so that there is every probability that the instrument will be ready for use during the summer of 1917.

**THE SUN.** In 1912 Professor Hale put forward a tentative working hypothesis to account for the phenomena observed in connection with the hydrogen flocculi associated with sunspots. According to Professor Hale, the flocculi may be classified in three classes: unipolar flocculi, consisting of curved or radial lines surrounding single spots; bipolar flocculi, surrounding a bipolar spot group and bearing a more or less close resemblance to the lines of force about a bar magnet; and multipolar flocculi, which resemble somewhat the bipolar flocculi, but have a less symmetrical configuration owing to the influence of the numerous spots in a complex group. The second class affords the most numerous examples. Various explanations of these phenomena have been offered, some investigators regarding them as entirely hydrodynamical in nature, while others, including Professor Hale himself, have attributed them mainly to the magnetic fields existent in sunspots. An initial vortex is supposed to be started by an internal eruption or some other cause which forces a column of gas upward from within the sun toward the surface of the photosphere, the vortical motion being due to differences in the velocities of adjacent surfaces as the column rises. Owing to expansion cooling takes place at the centre of the vortex and gives rise to the central dark cloud or umbra. Negative ions then flow rapidly in from the hot gases outside to the cooler gases in the centre, and, partaking of the vortical motion, set up a magnetic field, along the lines of force of which the hydrogen gases in the higher atmosphere are drawn. If the spot is bipolar, its polarities are opposite, and the hydrogen flocculi arrange themselves in lines like those due to a bar magnet. In order to test which of the two sets of forces—hydrodynamical, and magnetic—are the dominant factor in producing the configurations observed, Professor Hale and Mr. Luckey made an extensive series of laboratory experiments in vortical motion. Starting with the assumption that a single spot is represented by a columnar vortex, vortices of this type were formed by spinning a vertical wire helix in a tank of water, and it was found that eventually the lower extremity of such a vortex turned up until it met the surface of the water, and the two ends in the surface afforded an excellent representation of the two spots of a bipolar group. It was also found that horizontal columnar vortices produced at some distance below the surface of the water behaved in similar fashion when the velocity of spin became sufficiently great. By filling the space above the water with smoke

it became possible to study the secondary vortices which are set up in the air by semicircular vortices below the surface of the water, and characteristic configurations were obtained which seem to be duplicated in the sunspots, as shown in a series of spot photographs recently secured at Mount Wilson by Mr. Ellerman. Further experiments conforming more nearly to solar conditions are planned, and it is expected that these will clear up certain points which are at present obscure.

**Solar Activity.** The period of maximum solar activity is again approaching, and during the year a number of large spots made their appearance on the sun's disc from time to time, several persisting through more than one rotation period. One fine large group, which crossed the central meridian on May 25th, was nearly 100,000 miles long and contained several distinct umbra. Probably associated with this spot in some way was an eruptive prominence of exceptional altitude which was observed on May 26th by Mr. Evershed at his station in Kashmir. He was able to secure a complete series of photographs from almost the beginning of the eruption. The final altitude reached by the flying fragments was a little over a semidiameter of the sun, so that the height of the prominence must have been almost 500,000 miles, which is probably a record.

**Solar Eclipse.** A total eclipse of the sun took place on February 3rd. The path of totality, which was about 9000 miles long and from 50 to 100 miles wide, started in the Pacific Ocean, crossed Colombia, Venezuela, and the Island of Guadeloupe, and, passing a few miles to the west of the Azores, ended in the Atlantic Ocean about 200 miles south of the Irish coast. Owing to the preoccupations of the European observatories, none of them fitted out expeditions, and, of the American observatories, only the Argentine National Observatory at Córdoba seems to have dispatched a party to observe the eclipse. The expedition had its headquarters at Tucacas, Venezuela, but no details of its observations have yet been received. The eclipse appears to have been observed also by a party of ten unofficial observers at Barquisimeto, Venezuela, who made a number of interesting observations with very meagre equipment. They reported that a coronal ray, three solar diameters in length, was seen on the east side of the sun's disc, and that there was a large prominence, about 125,000 miles high, to the northwest of the disc. The corona was of intermediate type, showing less flattening at the poles than at a time of minimum solar activity.

**MARS.** Prof. W. H. Pickering continued his series of monthly reports on the appearance of Mars from his station at Mandeville, Jamaica. For convenience of reference, he divides the Martian year of 688.6 (taken as 689) Martian solar days into 12 months, to which he gives terrestrial names. The first nine months have 56 days each, and the remaining three 55 days. March is the first month of the Martian year, and the vernal equinox in the northern hemisphere of the planet falls on March 1st. The autumnal equinox falls on September 36th, and the summer and winter solstices on June 27th and December 12th, respectively. Among the interesting features noticed by Professor Pickering is the shifting of some of the markings on the surface of the planet, in some cases to the extent

of 200 miles, and it is suggested that they are swamps surrounded by low ground, which is liable to extensive inundation whenever the water-level rises slightly. Certain prominent markings which appeared in drawings made by Lockyer and other observers over 40 years ago were recorded as having disappeared completely.

Professor Lowell called attention to the fact that, contrary to the general belief, the "unfavorable" oppositions of Mars are really better suited than the "favorable" oppositions for viewing the canals, for it is then that the Martian season falls during which the canals are most visible, and, moreover, the planet at the same time turns toward the earth the hemisphere on which the canals are most noticeable.

From an examination of the records of the melting of the polar caps of Mars from 1862 to 1914, M. Antoniadi found that the rate of melting can be correlated with the solar activity. The melting was found to proceed most rapidly at the maxima of the sunspot cycles, and most slowly at the minima. Only four series of observations out of 21 failed to support his conclusions which are in general agreement with the commonly accepted view, derived from direct experiment, viz., that an increase in the solar activity is accompanied by an increase in the solar radiation. The exceptions were the oppositions of 1862, 1873, 1877, and 1886. During the first two oppositions which occurred during maximum sunspot periods, the rate of melting of the caps was found to be normal, while during the last two rapid melting took place at times when the solar activity was only slight, or at least subnormal.

**SATURN.** Professor Lowell made a new series of measurements of the rings of Saturn, and detected a number of new subdivisions in ring B. He claimed that these were due to the perturbative action of Mimas, Saturn's nearest satellite, since they occur where a particle belonging to the ring would revolve about the primary in a period having some simple ratio to the period of revolution of the satellite.

**MONOCHROMATIC PHOTOGRAPHY OF SATURN AND JUPITER.** In 1912, Prof. R. W. Wood, of Johns Hopkins University, showed how by combining photographs of the moon taken by light from three or more regions of the spectrum, it was possible to gain some idea of the nature of the rocks composing the lunar surface. The most conspicuous dealt with in his experiments was an area in the vicinity of the lunar crater Aristarchus which showed as a dark patch when photographed by ultra-violet light but was invisible in an ordinary photograph or one taken by the yellow rays. Laboratory experiments on various rocks and minerals led him to conclude that the patch is probably matter ejected at some time from the crater, and consists of sulphur or perhaps ash containing sulphur. He recently extended his researches to Jupiter and Saturn, and by means of suitable screens was able to secure photographs of both planets by infra-red, yellow, violet, and ultra-violet light. The most interesting results were obtained in the case of Saturn. The infra-red picture showed the planet practically free from surface markings. Through the yellow screen, the ordinary visual appearance of the planet showing the narrow belts very distinctly was seen. The photographs by violet and ultra-violet light resembled each other, a very broad, dark equatorial belt and a

dark polar cap being shown in both; the only difference was that the broad belt between the polar cap and the equatorial belt was decidedly broader in the ultra-violet photograph. Two possible explanations were suggested. According to one hypothesis, the crape ring extends inward to the surface of the planet and consists of material which reflects the short wave lengths to a slight degree. According to the second hypothesis, the planet's atmosphere contains some substance, a fine dust or perhaps a gas, which is capable of absorbing the violet and ultra-violet rays. Such a gas would be of a pale yellow color. Chlorine and sulphur vapor naturally suggest themselves, but laboratory experiments on these gases seem to negative the supposition that it is either of them. The photographs of Jupiter showed differences almost as marked as those of Saturn. In this case, however, it was found necessary, on account of the rapid motion of the planet, to make the pictures as quickly as possible in order to obtain comparable results.

**TRANSNEPTUNIAN PLANET.** The discovery of the planet Neptune forms one of the most interesting chapters in the history of astronomy. Adams and Le Verrier were prompted to take up the question of the existence of a trans-Uranian planet by the necessity of accounting for the constantly increasing deviations from the positions demanded by theory which Uranus exhibited. In like manner, the failure of both Uranus and Neptune to conform exactly to their ephemerides, has led recent astronomers to enquire whether the differences which still exist between the theoretical positions of those planets and their observed positions are not due to a still more remote member of the solar system than Neptune. In 1908 Prof. W. H. Pickering announced that he had obtained evidence of the existence of such a planet, and later Gaillot attempted to reconcile theory and observation by postulating the existence of two new planets lying beyond the orbit of Neptune. Neptune has been known far too short a time as yet for much reliance to be placed upon its deviations from its theoretical positions in a search for a more distant planet. The case is otherwise with Uranus, the earliest observation of which was made by Flamsteed in 1690, and for which there are a number of other observations prior to its recognition as a planet by Sir William Herschel in 1781. Prof. Percival Lowell examined the whole series of observations from 1690 to the present time, and announced that the residuals could be reduced by 71 per cent, or, including errors of observation, by from 90 to 100 per cent, by the hypothesis of a single unknown planet, for which two possible positions, differing by 180° in longitude, were indicated. The distances, periods, masses, and orbital eccentricities of the two bodies are practically identical, the distance being about 44 times the distance of the earth from the sun, the period of revolution 290 years, the mass one-fifty thousandth of the sun's mass, and the eccentricity of the orbit .2. The planet will probably have a magnitude of 12 or 13, with a disc about a second in diameter. As it will change its position in the heavens very slowly, it is hardly likely that it will leave a trail on a photographic plate of sufficient length to ensure its identification, but M. Borrelly considers that the photographic chart of the heavens on which are recorded stars as faint as the 14th magnitude will prove of use in its ultimate detection.

**STARS WITH LARGE PROPER MOTION.** Professor Barnard, at the Yerkes Observatory, made the photographic discovery of a faint star of the 11th magnitude in Ophiuchus which proved to possess the largest proper motion known, viz., 10 seconds per annum. Two other faint stars with large proper motions were also reported. One of these, a small red star near  $\alpha$  Centauri was discovered by Mr. Innes at the Cape of Good Hope Observatory, using the blink microscope method; its proper motion amounted to about five seconds per annum. The other was observed photographically by Prof. Max Wolf at Heidelberg. It is situated in the constellation Pisces, and has an annual proper motion of 2.6 seconds.

**STELLAR PARALLAXES BY SPECTROSCOPY.** In a series of papers published in the *Proceedings of the National Academy of Sciences*, Washington, Prof. W. S. Adams described a new method of determining parallaxes spectroscopically, which will undoubtedly lead to important results. He has found that the relative intensities of certain lines in the spectrum of a star are closely related to its absolute luminosity, and by measurements on stars of known luminosity he has been able to obtain curves which give the absolute luminosity when the relative intensity of the lines has been determined. A knowledge of the apparent luminosity then gives the distance of the star at once. The method was applied to 66 stars of known parallax, the agreement between the values of the parallaxes derived in this way and those obtained by direct measurement being very striking.

**PLANETARY ALBEDOES.** Prof. H. N. Russell, of Princeton University, re-determined the albedoes of the planets from the most reliable data. His results are given in the table below:

Object	Magnitude	Visual Albedo	Photographic Albedo
Moon	..... - 12.55	0.07	0.05
Mercury	..... - 2.50	0.06	...
Venus	..... - 4.77	0.59	0.60
Mars	..... - 1.85	0.15	0.09
Jupiter	..... - 2.29	0.56	0.73
Saturn	..... + 0.89	0.63	0.47
Uranus	..... + 5.74	0.63	...
Neptune	..... + 7.65	0.73	...

The high value, 0.89, of the earth's albedo, obtained in 1913 by Professor Very from the brightness of earthshine on the moon was revised, and the value 0.49 was obtained.

**COMETS.** Only one comet of short period—Perrine's (1896 VII)—was due to return to perihelion in 1916. Its period is 6.454 years. (Owing to its unfavorable position at its first return in 1903, it was not found at that time, but it was observed on the occasion of its next return in 1909. It was due to pass through perihelion about the middle of April, 1916, but being again unfavorably placed it was not seen. There was also a possibility of the return of D'Arrest's Comet, which has been observed six times—in 1857, 1870, 1877, 1890, 1897, and 1910—since its discovery in 1851. It is, however, not expected to pass through perihelion until April, 1917, and the year passed without its detection.

Three new comets were discovered in 1916. These were: 1916 a; discovered by Neujmin at Simeis, Russia, on February 24th. It was a faint object of about the 10th magnitude. Its perihelion passage took place on March 11th.

1916 b; discovered by Wolf at Heidelberg on

April 27th. It was at first reported as minor planet ZK, but its cometary nature soon became evident. It possessed a stellar nucleus and a nebulous envelope, and was of the 13th magnitude. It will not pass through perihelion until June 16, 1917.

1916 c; discovered by Metcalf at Winchester, Mass., on November 17th, but no information regarding its magnitude, etc., was forthcoming at the end of the year.

Taylor's Comet, 1915 e, the discovery of which at the Cape of Good Hope on Dec. 2, 1915, was noted in the YEAR BOOK for that year, was under observation during the early part of the year. It proved to be a comet of short period, the period being 6.37 years. At the beginning of January it was of the 8th magnitude, and possessed a short tail. Early in February, it showed two distinct nuclei, and shortly afterward became too faint for observation. It passed through perihelion on Jan. 30, 1916.

An attempt to photograph Encke's Comet at the Yerkes Observatory when in aphelion was unsuccessful, but Prof. Max Wolf secured a photograph of it at Heidelberg a month later. It had the appearance of a small nebula of the 16th magnitude and showed a slight central condensation.

**MINOR PLANETS.** The report on the minor planets discovered in 1916 is necessarily incomplete owing to the difficulty of obtaining the foreign astronomical periodicals and the uncertainty of their arrival in this country. Up to April 30th, the discovery of 32 new minor planets was reported. They were provisionally designated by the letters YJ to ZQ. Ten of them (YK to YS) belong properly to 1915, bringing the total of new planets found during that year up to 35. In addition a new minor planet, designated 1914 d, was discovered upon reexamination of a plate taken at Heidelberg in 1914. Five of the new planets were discovered by Thiele (Bergedorf), and one each at the U. S. Naval Observatory (Washington), Barcelona, and Simeis; the remaining 24 were found at Heidelberg by Prof. Max Wolf, who reported that the work of the observatory had been seriously disorganized by the war. ZK proved to be a new comet, the second of the year, and ZN was identified with 271 Pentesilea.

**NEW OBSERVATIONS.** The Van Vleck Observatory of Wesleyan University, Middletown, Conn., was dedicated on June 16th. The observatory is the gift of the late Joseph Van Vleck in memory of his brother, the late John Monroe Van Vleck, for many years professor of mathematics and astronomy in the university. The principal instrument is an equatorial refractor of 18½ inch aperture and 26 feet focal length, which is to be used principally for the photographic determination of stellar parallaxes. Prof. Frederick Slocum, of the Yerkes Observatory, was appointed the first director of the observatory.

The mounting of the 72-inch reflector for the Dominion Observatory at Vancouver, B. C., was completed, and the building and dome are almost finished, so that it will probably be possible to begin observational work during 1917.

**OTHER EVENTS.** The Bruce gold medal of the Astronomical Society of the Pacific was awarded to Prof. George Ellery Hale, director of the Mount Wilson Solar Observatory, for his distinguished services to astronomy. The gold

medal of the Royal Astronomical Society was awarded to Dr. J. L. E. Dreyer for his contributions to the history of astronomy and his catalogues of nebulae.

**BOOKS.** Among the books on astronomy published during 1916 were: J. Nasmyth and J. Carpenter, *The Moon, Considered as a Planet, a World, and a Satellite*, new edition; C. H. F. Peters and E. B. Knobel, *Ptolemy's Catalogue of Stars: A Revision of the Almagest*; T. C. Chamberlin, *The Origin of the Earth*; and Sir David Gill, *Man and Astronomer*, edited by George Forbes.

**ATHLETICS.** See under the various sports, as BASEBALL, BASKETBALL, BILLIARDS AND POOL, BOWLING, BOXING, CYCLING, etc.

**ATHLETICS, TRACK AND FIELD.** Three names stand out in the performances on track and field during the year 1916. They are James E. (Ted) Meredith, who set a new world's record for the half mile of 1 minute 52 $\frac{1}{2}$  seconds and for the quarter mile of 47 $\frac{3}{4}$  seconds; Robert Simpson, who established a new world's mark for the 120-yard high hurdles of 14 $\frac{3}{4}$  seconds, and Villar Kyronen, who won the senior national cross country (q.v.) championship.

Meredith created the new half-mile record in a dual track and field meet with Cornell at Franklin Field, Philadelphia, on May 13th. Less than a month later in the intercollegiate games at the Harvard Stadium, Cambridge, Mass., he shattered all existing records for the quarter mile. Simpson, a student at the University of Missouri, twice flashed over the high hurdles in record-breaking time, first at the Missouri Valley Conference meet and then at the Intercollegiate Conference meet.

The two-mile world's record in relay racing was equaled by the Yale University team, comprising H. Rolfe, A. Barker, H. Cooper, and John W. Overton, at the relay carnival conducted by the University of Pennsylvania. The time was 7 minutes and 53 seconds. Cornell at these same contests equaled the world's record for the four-mile relay, 17 minutes and 51 $\frac{3}{4}$  seconds, the team being G. Taylor, J. Hoffmire, L. Windnagle, and D. Potter.

John W. Overton of Yale University established a new indoor A. A. U. record of 2 minutes 15 $\frac{3}{4}$  seconds for the 1000-yard run at the indoor national championships. On the same occasion J. Loomis of the Chicago A. A. ran 60 yards in 6 $\frac{3}{4}$  seconds and George H. Goulding of the Toronto (Can.) Central Walking Club walked two miles in 13 minutes 7 seconds, both performances eclipsing all former records.

One international competition took place during 1916, a team comprising five athletes from the United States making the trip to Norway and Sweden. A series of dual meets was held in which the visiting athletes were invariably victorious. The American aggregation consisted of James E. Meredith of the University of Pennsylvania, Jo G. Loomis and Andy Ward of the Chicago A. A., Robert Simpson of the University of Missouri, and Fred S. Murray of Leland Stanford University.

Loomis with 13 firsts, 2 seconds, and 2 thirds scored the largest number of points, 85 $\frac{1}{4}$ . Murray finished first 6 times, second 10 times, third 7 times, and fourth twice for a total of 80 $\frac{1}{4}$  points.

The points gathered by the other United States athletes were: Simpson, 58 $\frac{3}{4}$ ; Meredith, 44 $\frac{1}{2}$ ; Ward, 36 $\frac{1}{4}$ . One of the surprises was the defeat

of Meredith by Jean Bolin, the Swedish star, in the 800-meter races. In the shorter distances, however, Meredith scored easy victories over his rival.

The National A. A. U. senior outdoor championships were held at Weequahic Park, Newark, N. J., on September 9th. The Irish-American A. C. won the team honors with a score of 35. The New York A. C. was second with 30, while unattached athletes gathered a total of 27 points.

Other clubs to score points were: Chicago A. A., 25; Boston A. A., 17; Illinois A. C., 13; University of Wisconsin, 10; Los Angeles A. C., 9; Irish-American A. A., Boston, 5; Toronto Walkers' Club, 5; Multnomah A. C., 5; Mississippi Agricultural College, 5; Millrose A. A., 4; Salem-Crescent A. C., 3; Meadowbrook Club, 3; Missouri A. C., 2; Seattle A. C., 2; Long Island A. C., 2; Germantown B. C., 1; Kaleva A. C., 1.

In the junior outdoor championships which were also held at Newark the New York A. C. won the team title with 52 points. The Chicago A. A. was second with 20, and the Irish-American A. C. third with 16. Other scores were: Irish-American A. A., Boston, 13; Boston A. A., 13; unattached, 13; Los Angeles A. C., 10; Tioga A. A., Pittsburgh, 8; Pittsburgh A. A., 6; Knights of St. Anthony, 6; Multnomah A. C., 5; Shanahan C. C., Philadelphia, 5; Salem-Crescent A. C., 5; Swedish-American A. C., 5; Mohawk A. C., 3; University of Illinois, 3; Bronx Church House, 3; Alpha P. C. C., 3; Meadowbrook Club, 3; Kaleva A. C., 3; Long Island A. C., 3; Gladiator A. C., 3; Pastime A. C., 3; Spokane A. C., 2; Newark A. C., 2; St. Christopher Club, 1.

The senior indoor championships held at the Twenty-second Regiment Armory, New York, were won by the New York A. C. with 23 $\frac{1}{4}$  points. The Irish-American A. C. was second with 22, and the Boston A. A. third with 16. The New York A. C. also captured the junior indoor laurels with a score of 40. The Irish-American A. C. was second with 27, and the Knights of St. Anthony third with 16.

The 41st annual track and field meet of the Intercollegiate Association of Amateur Athletes of America was held at the Harvard Stadium, Boston, Mass., on May 26th and 27th. Cornell won the championship with a total point score of 45. Yale finished second with 29, and the University of California and Leland Stanford tied for third with 22. The standing of the other colleges was: Pennsylvania, 18; Dartmouth, 14; Michigan, 13; Harvard, 11; Princeton, 10; Bowdoin, 5; Syracuse, 3; Penn State, 2; Massachusetts Institute of Technology, 1.

The University of Wisconsin was victorious in the 16th annual games of the Conference Colleges of the Middle West, with a total of 49 points. Illinois was second with 35 $\frac{3}{4}$ , and Chicago third with 20 $\frac{3}{4}$ . Other scores were: Missouri, 20 $\frac{1}{4}$ ; California, 13; Purdue, 11; Mississippi Agricultural, 5; Kansas University, 4 $\frac{1}{2}$ ; Notre Dame, 4; Minnesota, 3 $\frac{3}{4}$ ; Oberlin, 3; Indiana, 2; Northwestern, 2; Ohio State, 1; Ames, 1.

The New England intercollegiate championships were won by Dartmouth with 50 $\frac{1}{2}$  points. Maine was second with 32 $\frac{1}{2}$  and Holy Cross third with 18. New York University captured the Middle States Conference title by scoring 25 points. Lafayette was second with 24 and Rutgers third with 19.

Frederick W. Rubien, secretary-treasurer of the Amateur Athletic Union, made the following selections for All-America athletic teams:

All-America Athletic Team—100-yard dash, Jo G. Loomis, Chicago A. A.; 220-yard dash, Andy E. Ward, Chicago A. A.; 440-yard run, James E. Meredith, Meadowbrook Club, Philadelphia; 880-yard run, Don M. Scott, Mississippi Agricultural College; 1-mile run, L. V. Windnagle, Cornell University; 2-mile run, D. F. Potter, Cornell University; 5-mile run, Joie Ray, Illinois A. C.; 10-mile run, Hannes Kolehmainen; cross country running, Villar Kyronen, Millrose A. A., New York; 120-yard high hurdles, Robert Simpson, University of Missouri; 220-yard low hurdles, Fred S. Murray, Leland Stanford University; marathon running, A. V. Roth, Dorchester Club, Boston; walking, R. Remer, New York A. C.; standing broad jump, Platt Adams, New York A. C.; running broad jump, H. T. Worthington, Boston A. A.; standing high jump, W. H. Taylor, Irish-American A. C.; running high jump, W. M. Oler, Jr., New York A. C.; running hop, step, and jump, D. F. Ahearn, Illinois A. C.; pole vault, Sherman Landers, Chicago A. A.; putting 16-pound shot, Patrick J. McDonald, Irish-American A. C.; throwing 56-pound weight, Michael J. McGrath, Irish-American A. C.; throwing the discus, A. W. Mucks, University of Wisconsin; throwing 16-pound hammer, Patrick Ryan, Irish-American A. C.; throwing javelin, G. A. Bronder, Irish-American A. C.; pentathlon, Fred W. Kelly, Los Angeles A. C.; all-around, Avery Brundage, Chicago, A. A.

All-America College Team—100-yard dash, H. L. Smith, University of Michigan; 220-yard dash, W. B. Moore, Princeton University; 440-yard run, James E. Meredith, University of Pennsylvania; 880-yard run, Don M. Scott, Mississippi Agricultural College; 1-mile run, L. V. Windnagle, Cornell University; 2-mile run, D. F. Potter, Cornell University; cross country running, John W. Overton, Yale University; 120-yard high hurdles, Robert Simpson, University of Missouri; 220-yard low hurdles, Fred S. Murray, Leland Stanford University; running high jump, W. M. Oler, Jr., Yale University; running broad jump, H. T. Worthington, Dartmouth College; pole vault, F. K. Foss, Cornell University; putting 16-pound shot, H. B. Liverledge, University of California; throwing 16-pound hammer, C. C. Gildersleeve, University of California; throwing discus, A. W. Mucks, University of Wisconsin; throwing javelin, R. L. Nourse, Jr., Princeton University, pentathlon, Howard Berry, University of Pennsylvania.

All-America Interscholastic Team—100-yard dash, F. Motley, Jr., Atlantic City H. S., N. J.; 220-yard dash, Evan Pearson, North Central H. S., Spokane, Wash.; 440-yard run, J. Rogers, Northeast H. S., Philadelphia, Pa.; 880-yard run, A. W. Gorton, Moses Brown School, Providence, R. I.; 1-mile run, E. W. Shields, Mercersburg Academy, Pa.; 2-mile run, George R. Goodwin, Wakefield H. S., Mass.; cross country, Robert Crawford, Flushing H. S., N. Y.; 120-yard hurdles, Walker Smith, Phillips Exeter Academy, N. H.; 220-yard hurdles, Frank Loomis, Oregon H. S., Ill.; running high jump, W. H. Whalen, Phillips Exeter Academy, N. H.; running broad jump, E. Smalley, Central H. S., Philadelphia, Pa.; pole vault, Sherman Landers, Oregon H. S., Ill.; putting 12-pound shot, James

Sinclair, Stuyvesant H. S., N. Y.; throwing 12-pound hammer, J. T. Murphy, Hebron Academy, Me.; throwing discus, Gordon Brown, Montclair H. S., N. J.; throwing javelin, Van Cortlandt Eliot, Hamilton Institute, N. Y.

See CROSS COUNTRY RUNNING AND MARATHONS.

**ATOMIC WEIGHTS.** See CHEMISTRY, GENERAL.

**AUSTRALIA, COMMONWEALTH OF.** A self-governing dominion of the United Kingdom, consisting of six original States and two territories. The temporary seat of the Federal government is Melbourne, in the State of Victoria. The permanent capital will be Canberra, founded 1913, in the Federal Capital Territory. Canberra is 204 miles southwest of Sydney, 429 miles northeast of Melbourne, and about 123 miles from Jervis Bay. The Federal Capital Territory is within the State of New South Wales.

**AREA AND POPULATION.** Australia is a vast region, much of which is uninhabited. A large part of the interior, especially in the west, is sandy and stony desert. In the table below are shown by States and territories the estimated area and the population according to the census of April 3, 1911, compared with the population as estimated at the end of 1915:

	Square miles	Population	
		1911	1915
New South Wales....	309,460	1,646,784	1,868,648
Victoria .....	87,884	1,815,551	1,417,801
Queensland .....	670,500	405,813	680,446
South Australia .....	380,070	408,558	489,860
Western Australia .....	975,920	282,114	318,016
Tasmania .....	26,215	191,211	201,025
Northern Territory....	528,620	3,810	4,568
Federal Capital Ter... ..	912	1,714	1,829
Commonwealth ..	2,974,581	4,455,005	4,981,988

The Australian States, excepting Tasmania, are notable in respect of their large areas, and Tasmania is slightly larger than Vermont, New Hampshire, and Massachusetts combined. Thus, Victoria, which is next to the smallest State, is more than half as large as Sweden, while the largest State, Western Australia, is more than twenty times as large as the State of Louisiana. New South Wales covers about 10.4 per cent of the area of the Commonwealth; Victoria, 3.0; Queensland, 22.5; South Australia, 12.8; Western Australia, 32.8; Tasmania, 0.9; Northern Territory, 17.6.

In the table above, the population figures are exclusive of full-blooded aboriginals. Such persons more or less civilized and in the employ or within the settlements of whites numbered 19,939. The total number of full-blooded aboriginals is not known; authorities believe that it was never large and that at present it does not exceed 100,000. In his report of May 31, 1913, the Queensland chief protector of aborigines estimates the total at 80,866, distributed as follows: New South Wales, 4761; Victoria, 269; Queensland, 20,000; South Australia and the Northern Territory, 29,836; Western Australia, 26,000. The last Tasmanian aboriginal died in 1876.

Persons of non-European race were returned at the 1911 census to the number of 52,343. Half-caste aboriginals numbered 10,113; full-blood and half-caste Asiatics, 34,838 and 3852 respectively; Africans, 357 and 336; Americans, 65 and 24; Polynesians, 2524 and 227; indefinite, 5 and 2.



Of the population in 1911 3,667,670 were born in Australia, 590,722 in the United Kingdom, 73,949 in other European countries, 31,868 in New Zealand, 36,442 in Asia, 4958 in Africa, 11,278 in America, 3410 in Polynesia, 4238 at sea, and 30,470 unspecified. The total number of males was 2,213,035, and of females 2,141,970.

The Australian population exhibits an excessive tendency to accumulate in towns, especially in the capital cities and their suburbs. In 1911, the aggregate metropolitan population (that is, the population of the State capitals with suburbs) was 1,694,329, or 38.05 per cent of the total population of the Commonwealth; as estimated for Dec. 31, 1913, 1,890,400, or 38.80 per cent. The capital of New South Wales is Sydney, which with suburbs had in 1911 629,503 inhabitants, while the estimated population at the end of 1913 was 725,400, or 39.60 per cent of the population of the State; capital of Victoria, Melbourne, with suburbs 588,971 in 1911, 651,000 in 1913, 46.10 per cent; of Queensland, Brisbane, 139,480 in 1911, 151,300 in 1913, 22.92 per cent; of South Australia, Adelaide, 189,646 in 1911, 201,000 in 1913, 45.68 per cent; of Western Australia, Perth, 106,792 in 1911, 121,700 in 1913, 37.95 per cent; of Tasmania, Hobart, 39,937 in 1911, 40,000 in 1913, 19.83 per cent. The capital of the Northern Territory is Darwin; in 1911 it had 958 inhabitants, or 28.94 per cent of the censused persons in the territory. The table below shows the area in acres of the capital cities with suburbs, their estimated population in 1915, and their percentage of the total State population:

	Acres	Population		Total	Per cent.
		Male	Female		
Sydney	118,299	522,700	361,300	763,000	40.83
Melbourne	163,374	322,700	361,300	684,000	48.24
Brisbane	195,277	79,170	82,768	161,938	23.80
Adelaide	170,850	100,107	109,343	209,450	47.64
Perth	89,000	53,231	53,561	106,792	33.58
Hobart	46,730	18,557	21,281	39,838	19.82

The average natural increase per annum in the Commonwealth in the period 1904-13 was 69,596. The number of marriages, births, and deaths, with the rate per 1000 mean population, was as follows in 1915:

	Marriages		Births		Deaths	
	No.	Rate	No.	Rate	No.	Rate
N. S. W.	18,129	9.70	52,885	28.30	19,610	10.50
Vic.	12,832	9.00	85,010	24.55	15,823	11.10
Qld.	6,141	8.94	20,165	29.35	7,560	11.00
S. A.	3,965	9.01	11,798	26.81	4,694	10.67
W. A.	2,580	8.00	9,018	27.98	2,992	9.28
Tas.	1,600	8.03	5,845	29.32	2,015	10.11
N. Ter.	12	2.73	61	13.85	97	22.08
Fed. C. Ter.	4	1.22	47	19.05	17	6.89
Total.	45,263	9.14	134,829	27.24	52,808	10.67

The average net immigration per annum in the period 1904-13 was 25,951, distributed as follows: New South Wales (including the Federal Capital Territory), 12,931; Victoria, 3748; Queensland, 4280; South Australia (including the Northern Territory), 2040; Western Australia, 4578; Tasmania, -1626 (departures in excess of arrivals). In 1913, arrivals and departures oversea numbered 141,906 and 87,131 respectively; in 1914, 111,086 and 128,456; in 1915, 70,961 and 162,014. The decrease of arrivals and the increase of departures in 1914 and 1915 are largely due to the great war. In

1914, the excess of births over deaths was 86,263, and the excess of departures over arrivals 17,370; so that the total increase of population in that year is stated at 68,893 (the total population at the end of 1913 was estimated at 4,872,059 and at the end of 1914 at 4,940,952).

RELIGION AND EDUCATION. The leading religious denomination is the Church of England. The 1911 census made the following classifications: Christian, 4,274,414; non-Christian, 36,785; indefinite, 14,673; no religion, 10,016; object to state, 83,003; unspecified, 36,114. Adherents of the Church of England numbered 1,710,443; Roman Catholics, 921,425; Presbyterians, 558,336; Methodists, 547,806; Baptists, 97,074; Congregationalists, 74,046; Lutherans, 72,395; adherents of the Church of Christ, 38,748; adherents of the Salvation Army, 26,665.

The number of persons five years of age and upwards at the 1911 census was 4,019,372; of these 139,749 were not able to read, and 95,727 were not recorded in respect of literacy.

State schools, teachers (exclusive of sewing mistresses), pupils enrolled, and the average attendance are reported as follows for 1913:

	Schools	Teachers	Pupils	Av. At.
N. S. W.*	3,285	6,627	245,819	178,028
Vic.	2,218	5,734	218,712	157,140
Qld.	1,898	3,246	98,619	79,955
S. A.	815	1,627	58,656	48,319
W. A.	556	1,303	41,558	36,264
Tas.	481	897	26,919	21,174
N. Ter.	4	6	123	68
Total	8,647	19,440	685,406	515,948

\* Including the Federal Capital Territory.

In 1912, the enrollment was 662,576, and the average attendance 496,252; in 1911, 638,850 and 463,799. Private schools in 1913:

	Schools	Teachers	Pupils	Av. At.
N. S. W.	733	3,593	64,591	54,305
Vic.	519	1,846	49,549	40,000
Qld.	153	795	18,092	15,518
S. A.	164	638	12,362	9,281
W. A.	119	459	10,385	9,101
Tas.	88	320	6,275	4,434
N. Ter.	1	2	65	40
Total	1,777	7,653	161,269	132,679

In 1912, the enrollment at private schools was 164,085 and the average attendance 133,940; in 1911, 160,794 and 132,588.

The following figures show the number of teachers and students at the Australian universities in 1913:

	Students		
	Teachers	Matriculated	Total
Sydney	134	1,167	1,645
Melbourne	82	...	1,256*
Adelaide	49	415	720†
Tasmania (Hobart)	11	92	162
Queensland (Brisbane)	23	198	207
W. Australia (Perth)	12	118	182

\* Exclusive of 86 music students. † Exclusive of 318 music students.

PENSIONS. The first State in the Commonwealth to introduce old-age pensions was Victoria, whose legislation on the subject became operative Jan. 18, 1901. The pension system of New South Wales came into force Aug. 1, 1901, and that of Queensland July 1, 1908. In the latter year an act providing for old-age pensions

throughout Australia was passed by the Commonwealth Parliament, superseding the State acts; it was assented to June 10, 1908, and payment of old-age pensions began as from July 1, 1909. The act also provided for invalid pensions, the first payments of which were made Dec. 15, 1910. The age qualification for an old-age pension is 65 years or, in the case of permanent incapacitation for work, 60 years. For women the age qualification has been 60 years since Nov. 19, 1910. The age qualification for an invalid pension is 16 years in case of permanent incapacitation for work. The rate of pension for either old age or invalidity is fixed by the commissioner of pensions or his deputy and must not exceed £28 per annum or be such as to make the pensioner's total income exceed £52 per annum. The following table shows the number of pensioners and the amount paid in pensions during fiscal years ended June 30th:

	No. of Pensioners			Amount Paid
	Old-age	Invalid	Total	
1910	65,492	.....	65,492	£1,497,380
1911	75,502	7,451	82,953	1,868,684
1912	79,071	10,768	89,839	2,148,034
1913	82,943	13,739	96,682	2,289,048
1914	87,780	16,865	104,645	2,579,265

In addition to the amounts stated above there are payments to asylums for the maintenance of pensioners; these aggregated £13,287 in 1913 and £14,236 in 1914. Of the old-age pensioners on June 30, 1914, males numbered 37,346 and females 50,434; that is, the masculinity, or the number of males to each 100 females, was 74.05. The invalid pensioners on the same date comprised 5454 males and 8411 females, the masculinity being 100.51. During the year 1913-14 the total cost to the Commonwealth of administering the Old-age and Invalid Pensions Department was £46,946, or about 1.8 per cent of the amount paid in pensions.

**PRODUCTION.** The values of the products of the Commonwealth as officially estimated for several years are shown below in thousands of pounds sterling:

	1908	1910	1912	1913
Agricultural	37,150	39,752	45,754	46,260
Pastoral	47,259	56,993	51,615	57,866
Dairy, poultry, etc.	15,045	17,387	20,280	20,341
Forestry and fisheries	4,286	4,789	6,432	6,338
Mining	24,580	23,215	25,629	25,808
Manufacturing*	86,637	45,598	57,022	61,586
Total	164,957	187,784	206,732	218,199

\* These amounts differ from figures sometimes used which include certain products here classified with dairy farming and forestry.

**Agriculture.** The area under crop in Australia in 1913-14 was 14,683,012 acres, as compared with 13,038,049 acres in 1912-13, 11,893,838 in 1910-11, and 9,433,455 in 1905-06. These areas do not include lands under permanent artificially sown grasses, which amounted to 3,208,362 acres in 1913-14 and 2,987,419 acres in 1912-13. Of the area under crop in 1913-14, New South Wales had 4,567,592 acres (which amount to 2.230 per cent of the area of the State); Victoria, 4,391,321 acres (7.807 per cent); Queensland, 747,814 (0.174); South Australia, 3,169,559 (1.303); Western Australia, 1,537,923 (0.246); Tasmania, 264,140 (1.574); Northern Territory, 354; Federal Capital Territory, 4309

(0.738); Commonwealth, 14,683,012 (0.771). Area and production of the principal grain crops and hay in 1913-14:

	Wheat		Oats	
	Acres	Bu.	Acres	Bu.
N. S. W.	3,203,572	37,996,068	103,262	1,832,616
Vic.	2,565,861	32,936,245	442,060	8,890,321
Qld.	132,655	1,769,432	4,093	56,236
S. A.	2,267,851	16,986,988	116,932	1,200,740
W. A.	1,097,193	13,331,350	133,625	1,655,681
Tas.	18,432	349,736	58,886	1,593,664
Cwltth.	9,287,398	103,844,132	859,020	15,232,048
1912-13	7,339,651	91,981,070	874,284	16,116,712
1900-1	5,666,614	48,353,402	470,308	12,048,310

	Maize		Hay	
	Acres	Bu.	Acres	Tons
N. S. W.	156,793	4,452,989	798,978	952,489
Vic.	17,960	800,529	977,684	1,350,374
Qld.	156,775	8,915,376	76,469	103,985
S. A.	239	2,336	568,550	571,616
W. A.	38	421	246,640	278,585
Tas.	.....	.....	84,188	112,958
Cwltth.	331,879	9,173,321	2,754,672	3,372,596
1912-13	314,686	8,356,158	3,217,041	3,955,311
1900-1	348,505	9,354,971	1,517,963	1,834,448

Next to wheat the most important crop is hay, and a very large proportion of it is cereal grasses; in New South Wales, South Australia, and Western Australia the principal hay crop is wheat, in Victoria oats, and in Queensland alfalfa. The acreage of crops not included in the table above were as follows in 1913-14: green forage, 486,504; orchards and fruit gardens, 216,921; sugar cane, 160,976; potatoes, 174,262; barley, 222,564; vineyards, 61,197; all other, 128,519. Sugar cane is grown for sugar-making only in Queensland and New South Wales, and much more extensively in the former than in the latter. Of the acreage in 1913-14, Queensland had 102,803 acres of productive and 44,940 of unproductive cane; New South Wales, 6198 acres of productive and 7034 of unproductive. The output of sugar in Queensland in 1913-14 was 207,196 tons; in New South Wales, 17,295; total, 224,491. Sugar produced in Australia by colored labor decreased from 107,454 tons in 1904-5 to 6693 in 1912-13 and 8814 in 1913-14. See AGRICULTURE.

**Grazing.** The following figures for live stock relating to 1914 are taken from a statement published in 1916 by the government statistician of Queensland:

	Horses	Cattle	Sheep	Swine
N. S. W.	893,393	2,317,540	33,009,088	236,704
Vic.	552,058	1,362,542	12,051,685	243,196
Qld.	743,059	5,455,948	23,129,919	166,688
S. A.	267,877	300,579	4,208,461	69,893
W. A.	161,625	863,835	4,456,186	59,816
Tas.	42,232	176,524	1,674,845	34,960
N. Ter.	21,985	414,558	70,200	1,240
F. C. Ter.	1,806	4,961	134,679	226
Cwltth.	2,683,830	10,896,040	78,735,013	862,678
1913	2,521,988	11,483,882	85,057,402	800,505
1912	2,408,113	11,577,259	83,263,686	845,255
1910	2,165,866	11,744,714	92,047,015	1,025,850
1900	1,609,654	8,640,225	70,602,995	950,349

Australia's pastoral wealth is chiefly in wool; the output for the season ended June 30, 1914, was valued at about £28,588,000. The bulk of the wool is exported, the quantity used in local woolen mills being little more than 1.5 per cent of the total production. The estimated output in 1913-14, stated as in the grease, was 711,134,203 pounds, as compared with 648,851,

913 in 1912-13 and 726,408,625 in 1911-12. The Commonwealth statistician notes that a shortage apparently occurred in the collection of these statistics, as the aggregate estimates fall considerably below the approximate totals obtained from oversea shipments together with the quantity used in local manufacture. The total so obtained represented 754,123,633 pounds for 1913-14, 668,667,078 for 1912-13, and 785,753,099 for 1911-12.

**Mining.** According to statistics published in 1916, the Commonwealth's mineral output (exclusive of building stone, slate, cement, etc.) was valued in 1914 at £22,488,138; the total for 1913 was £25,807,557, and for 1912 £25,629,238. The total for 1914 comprised the following values: gold, £8,763,895; coal, £4,306,558; copper, £2,309,647; tin, £758,081; silver, £373,517; other, £5,976,440. The following table shows the value of the most important minerals, and the total for all minerals, produced in 1913, and the grand total of mineral production in each of the States from the beginning of mining to the end of that year; comparative totals are also given for 1912 and 1901:

	Gold £	Coal £	Sil. Id.* £	Copper £
N. S. W. . . . .	635,703	3,770,365	4,173,867	598,733
Vic. . . . .	1,847,475	274,940	2,074	2,829
Qld. . . . .	1,128,768	403,767	134,121	1,660,178
S. A. . . . .	27,800	.....	1,400	488,986
W. A. . . . .	5,581,701	153,614	82,422	142,513
Tas. . . . .	141,876	25,367	319,997	375,664
N. Ter. . . . .	13,250	.....	2,228	482
Cwth. . . . .	9,376,578	4,828,058	4,716,109	3,269,385
1912 . . . . .	9,879,928	4,418,025	4,221,890	3,243,837
1901 . . . . .	14,005,732	2,602,770	2,367,687	2,208,590

	Zinc £	Tin £	Total 1913 £	Gd. Total £
N. S. W. . . . .	1,547,987	421,292	11,649,089	238,999,476
Vic. . . . .	.....	6,959	2,171,477	297,964,843
Qld. . . . .	.....	348,669	3,857,881	107,759,354
S. A. . . . .	.....	.....	632,519	31,059,148
W. A. . . . .	.....	72,142	6,086,265	119,374,107
Tas. . . . .	.....	531,983	1,415,700	38,085,479
N. Ter. . . . .	.....	25,526	44,626	2,887,399
Cwth. . . . .	1,547,987	1,401,571	25,807,557	836,129,806
1912 . . . . .	1,766,242	1,358,152	25,629,238	810,322,249
1901 . . . . .	.....	432,576	.....	.....

\* Silver and lead.

The largest gold production in Australia was in 1903, when the output amounted to £16,294,684. Since that year the total annual output has steadily declined.

In the ten-year period 1904-13 Western Australia contributed 54.05 per cent of the annual average output of gold; Victoria, 21.12; Queensland, 15.45; New South Wales, 7.24; Tasmania, 1.70; South Australia, 0.24; Northern Territory, 0.20.

The number of persons reported as engaged in mining of all kinds in 1913 was 92,262.

**COMMERCE.** Australian importation attained its maximum in 1913, with a value of £79,749,653; exportation in 1911, with £79,482,258. With the great war there came a sharp decline in imports and exports of merchandise, while the year 1915 was marked by a large increase in the exportation of precious metals. Imports of merchandise are reported at £72,641,000 and £68,500,000 in 1914 and 1915 respectively, and of bullion and specie at £1,305,000 and £863,000; exports of Australian produce, £62,843,000 and

£57,610,000, and of bullion and specie (including gold and silver in matte and gold ore) at £2,995,000 and £11,176,000. Reported value of principal domestic exports:

	1913	1914	1915
Wool . . . . .	£26,277,000	£18,375,000	£28,243,000
Preserved meat . . . . .	7,131,000	9,114,000	8,016,000
Copper . . . . .	2,879,000	2,142,000	2,866,000
Hides and skins . . . . .	5,520,000	4,147,000	2,806,000
Lead . . . . .	1,848,000	1,819,000	2,720,000
Butter . . . . .	3,565,000	2,655,000	1,820,000
Wheat . . . . .	7,987,000	9,996,000	289,000

Imports, domestic exports, and total exports are shown in the table below. The figures for 1914 are for the first six months only; in that year the trade year was changed from the calendar to the fiscal year ending June 30th.

	Exports		
	Imports	Domestic	Total
1911 . . . . .	£66,967,488	£76,205,210	£79,482,258
1912 . . . . .	78,158,600	75,961,563	79,096,090
1913 . . . . .	79,749,653	75,188,147	78,571,769
1914 . . . . .	39,777,497	36,265,764	37,930,087
1914-15 . . . . .	64,380,747	58,273,110	60,600,302

In the year 1914-15, imports and exports of specie amounted to £434,601 and £1,994,400 respectively. Leading imports in 1914-15, in thousands of pounds sterling: metal manufactures, 9433; cotton and linen piece goods, 4267; apparel (exclusive of hats and caps), 3578; machinery, 3501; drugs, chemicals, and fertilizers, 2426; timber, 2150; silk piece goods, 2082; oils in bulk, 1893; woolens, 1850; bags and sacks, 1552; tea, 1529; spirits, 1291; tobacco, 902; arms and explosives, 744; boots and shoes, 624; books, 608; agricultural implements, 513. Principal exports in 1914-15, in thousands of pounds sterling: wool, 22,088; beef, 4990; hides and skins, 3522, mutton and lamb, 3414; butter, 2687; copper matte, ingots, ore, and bars, 2303; lead, pig and in matte, 2009; gold specie, 1941; tinned meat, 1854; tallow, 1571; leather, 1183; wheat, 859; timber, 795; silver, bullion, ore, and in matte, 755; coal, 721; gold, bullion, and in matte, 683; zinc concentrates, 613; live animals, 541; rabbits and hares, 531; flour, 509; tin ore, 187. The outbreak of the great war caused to be prohibited the exportation of many articles or restricted their exportation to British dominions or countries of the Allies.

Australian commerce with the more important countries is shown below for the years 1913 and 1914-15, in thousands of pounds sterling:

	Imports		Exports	
	1913	1914-15	1913	1914-15
United Kingdom . . . . .	47,616	37,905	34,805	38,548
United States . . . . .	9,523	9,552	2,631	4,947
British India . . . . .	2,964	2,646	1,355	1,425
New Zealand . . . . .	2,514	2,095	2,357	2,809
Japan . . . . .	919	1,393	1,429	1,967
Germany . . . . .	4,957	1,297	6,378	473
Ceylon . . . . .	969	977	1,124	435
Java . . . . .	714	787	687	384
Belgium . . . . .	2,359	524	7,466	796
France . . . . .	625	241	9,684	1,280
Union of So. Africa . . . . .	127	118	1,941	2,023

Share of the States in the foreign trade of 1914-15: New South Wales, £27,323,243 imports and £28,107,025 exports; Victoria, £20,997,294 and £12,357,334; Queensland, £6,428,688 and £12,015,484; South Australia, £4,750,361 and £3,566,335; Western Australia, £3,986,198 and

£3,120,798; Tasmania, £811,255 and £420,007; Northern Territory, £83,708 and £13,319.

**SHIPPING.** Merchant marine in 1914: steamers, 1165 of 329,105 tons; sail, 1632 of 120,532 tons; total, 2797 vessels of 449,637 tons, as compared with 2772 of 412,423 tons in 1910. Shipping entered and cleared in oversea trade:

	Entered		Cleared	
	Vessels	Tons	Vessels	Tons
1910	1988	4,607,820	2060	4,725,326
1912	2035	5,163,357	2017	5,111,957
1913	2014	5,371,581	1971	5,230,417
1914-15	1568	4,174,955	1648	4,424,308

**COMMUNICATIONS.** In the eastern, southeastern, and southern parts of the continent there is a considerable network of railway lines converging upon the principal ports. The ports are connected by lines running more or less parallel to the coast. In the east lines radiating from Townsville, Rockhampton, Brisbane, and Sydney extend inland for distances ranging up to 600 miles. In the southeast numerous lines converge upon Sydney and Melbourne. In the south four main lines, with branches, extend from Melbourne, and one main line, also with branches, runs north from Adelaide nearly 700 miles, while another extends southeast to meet the line from Melbourne at the Victorian border. The main interstate line, connecting Brisbane and Adelaide by way of Sydney and Melbourne, extends 1790 miles. In Western Australia there is a connected system of lines between the ports and the inland districts that are being developed. In Tasmania the principal towns are connected by rail. The longest possible railway journey in Australia on one continuous line is from Longreach in Queensland to Oodnadatta in South Australia, the distance being 3303 miles.

The length of government railways (that is, the railways owned by the Commonwealth government and by the State governments) open to traffic June 30, 1915, is reported at 18,999 miles. The cost of construction and equipment up to June 30, 1913 (for 17,775 miles) was £160,557,160; the gross receipts in 1914-15 were £20,743,029, and working expenses £15,140,230. The following table shows the railway mileage in operation June 30, 1914, for government lines and Dec. 31, 1913, for private lines (a Federal railways; b State railways; c private railways open to general traffic; d total open to general traffic; e private railways open for special purposes; f total railway mileage):

	a	b	c	d	e	f
N. S. W. . . .	3,967	155	4,122	124	4,246	
Vic. . . . .	3,835	14	3,849	37	3,886	
Qld. . . . .	4,570	527.5	5,097.5	115.5	5,213	
S. A. . . . .	478	1,845	2,323	34	2,357	
W. A. . . . .	2,967	277	3,244	666	3,910	
Tas. . . . .	519	164.5	683.5	83	766.5	
N. Ter. . . .	146	.....	146	.....	146	
F. C. Ter. .	5	.....	5	.....	5	
<b>Cwth.</b>	<b>629</b>	<b>17,703</b>	<b>1,188</b>	<b>19,470</b>	<b>1,059.5</b>	<b>20,529.5</b>

Of the total length of railway, 4602 miles were 5 ft. 6 in. gauge (chiefly in Victoria); 4126.5 miles 4 ft. 8.5 in. gauge (entirely in New South Wales and the Federal Capital Territory); 11,408 miles 3 ft. 6 in. gauge (chiefly in Queensland and Western Australia); 122 miles 2 ft. 6 in. gauge (in Victoria); and 271 miles 2 ft. gauge.

Towards the end of 1916 it was reported that 917 miles of the East to West transcontinental line from Kalgoorlie to Port Augusta had been laid and that but 41 miles remained for its completion. Up to July 29, 1916, the cost of this line had amounted to £4,255,961 (\$20,683,970), exclusive of rolling stock and stores on hand. Rolling stock had cost £809,745 (\$3,352,361).

At the end of 1913, the number of telegraph offices was 4624, with 46,218 miles of line and 108,931 miles of wire; post and receiving offices, 8409.

**FINANCE.** The estimated Commonwealth revenue and expenditure for the fiscal year 1915-16 amounted to £23,540,000 and £74,108,964 respectively, the revenue including £6,290,000 customs and excise, which as expenditure was allocated to the several States. The largest estimated disbursement was for military and naval operations in connection with the great war, amounting to £45,749,450. For the fiscal year 1914-15, the revenue was reported at £22,411,711 and the expenditure at £38,047,963. The final, official figures for revenue and expenditure are given below:

Revenue	1910-11	1913-13	1913-14
	£	£	£
Customs	10,507,080	13,055,925	12,652,737
Excise	2,473,364	2,497,109	2,325,333
Post, telegraphs, and telephones	3,906,015	4,226,313	4,511,307
Land tax	1,370,344	1,564,794	1,609,836
<b>Total, incl. other.</b>	<b>18,806,237</b>	<b>21,907,084</b>	<b>21,741,775</b>
Expenditure	£	£	£
Posts, telegraphs, and telephones	3,559,785	4,781,524	5,157,022
Defense	1,395,798	2,612,687	2,950,722
Treasury	1,960,318	2,910,224	2,787,034
Trade and customs	1,051,497	875,784	780,458
External affairs	454,128	539,722	678,974
Parliament	211,558	281,261	243,168
<b>Total, incl. other.</b>	<b>18,158,529</b>	<b>15,787,154</b>	<b>15,458,776</b>
Subsidies to states	5,603,191	6,119,930	6,282,999
<b>Grand total.</b>	<b>18,761,720</b>	<b>21,907,084</b>	<b>21,741,775</b>

The Commonwealth debt on June 30, 1914, was £10,182,333; on June 30, 1915, £37,394,148, including a war loan of £14,824,105 from the British government.

The table below shows, in thousands of pounds sterling, the final figures of State revenue and expenditure for 1913-14 and the corresponding amounts as reported for 1914-15:

	Revenue		Expenditure	
	1913-14	1914-15	1913-14	1914-15
N. S. W. . . .	18,299	18,929	17,702	18,485
Vic. . . . .	10,731	10,529	10,718	11,707
Qld. . . . .	6,973	7,203	6,963	7,199
S. A. . . . .	4,823	3,973	4,604	4,662
W. A. . . . .	5,205	5,141	5,341	5,707
Tas. . . . .	1,238	1,244	1,235	1,384
<b>All States</b>	<b>47,296</b>	<b>47,018</b>	<b>46,562</b>	<b>49,095</b>

In addition to the ordinary expenditure, as given in the table above, the States each year make disbursements from loan funds for railways, water supply and sewerage, roads, harbors, advances to settlers, and other public works and purposes. Such expenditure by New South Wales in 1913-14 amounted to £9,126,844; Victoria, £3,276,994; Queensland, £2,190,150; South Australia, £2,762,686; Western Aus-

tralia, £2,883,169; Tasmania, £498,141; all States, £20,737,984, as compared with £18,429,274 in 1912-13 and £3,424,475 in 1904-5.

Public debt of the States June 30, 1914: New South Wales, £116,695,031; Victoria, £66,130,726; Queensland, £54,523,506; South Australia, £33,564,332; Western Australia, £34,420,181; Tasmania, £12,265,012; total, £317,598,788, as compared with £294,472,486 in 1913 and £230,738,671 in 1905. Aggregate State sinking funds in 1914 amounted to £7,784,961.

NAVY. The royal Australian navy constitutes one of the three units of the British eastern fleet. It is controlled by the Commonwealth government in peace and by the British government in war. In April, 1915, the navy comprised the following commissioned vessels: *Australia*, battlecruiser, 19,200 tons, 44,000 h. p.; *Childers* and *Countess of Hopetoun*, first class torpedo boats; *Encounter*, light cruiser, 5880 tons, 12,500 h. p.; *Gayundah*, gunboat, 360 tons, 400 h. p.; *Melbourne*, light cruiser, 5600 tons, 22,000 h. p.; *Parramatta*, torpedo-boat destroyer, 700 tons, 12,000 h. p.; *Pioneer*, light cruiser, 2200 tons, 7000 h. p.; *Protector*, gunboat, 920 tons, 1641 h. p.; *Sydney*, light cruiser, 5600 tons, 22,000 h. p.; *Tingira*, boys' training ship, 1800 tons; *Una* (late *Comet*), gunboat, 950 tons, 1350 h. p.; *Warrego* and *Yarra*, torpedo-boat destroyers, each 700 tons, 12,000 h. p.; AE2, submarine, 800 tons, 1750 h. p. Building in April, 1915, were: *Brisbane*, light cruiser, 5600 tons, 22,000 h. p., at Sydney; *Derwent*, torpedo-boat destroyer, 700 tons, 12,000 h. p., at Sydney; *Karumba*, oil-supply ship, 3000 tons, in England; *Platypus*, submarine depot ship, 3100 tons, in Scotland; *Swan* and *Torrens*, torpedo-boat destroyers, each 700 tons, 12,000 h. p., at Sydney. The strength of the naval forces (permanent and reserve) in April, 1915, was 9423 officers and men.

GOVERNMENT. Australia is a Federal Commonwealth within the British Empire. The executive authority is vested in the British sovereign acting through a governor-general, whom the sovereign appoints and who is assisted by a responsible ministry, the executive council. The legislative power is exercised by a parliament of two chambers, the Senate and the House of Representatives. Senators, 36 in number (six from each State), are elected for six years, and representatives for three years — all by universal suffrage. The number of representatives is as nearly as may be twice as great as that of senators, the number from each State being in proportion to population, but no State having less than five. On the basis of the 1911 census, New South Wales has 27 representatives; Victoria, 21; Queensland, 10; South Australia, 7; Western Australia, 5; Tasmania, 5; total, 75. The Governor-General in 1916 was Sir Ronald Craufurd Munro-Ferguson, G. C. M. G., who assumed office May 18, 1914, in succession to Thomas Baron Denman, G. C. M. G. Ministry in 1916 (formed Oct. 27, 1915, in succession to the ministry of Andrew Fisher, who became high commissioner for Australia in London): Prime minister and attorney-general, William Morris Hughes; minister for external affairs, Hugh Mahon; home affairs, King O'Malley; defense, George Foster Pearce; trade and customs, Frank Gwynne Tudor; navy, Jens August Jensen; postmaster-general, W. Webster; treasurer, W. G. Higgs; vice-president of the executive council, Albert

Gardiner; honorary minister, Edward John Russell.

## HISTORY

THE QUESTION OF CONSCRIPTION. On February 18th, the Premier of Australia, Mr. William M. Hughes (q.v.), was appointed a member of the Canadian Privy Council, this being the first occasion upon which a member of one of the Overseas Dominions became also a member of the Canadian government. The vigorous campaign of Mr. Hughes in Canada, and afterwards in England, for the solidification of the Empire and the relentless prosecution of the war, and especially his advocacy of conscription, offended an important element in the Labor party, which in his absence passed resolutions condemning his attitude and pronouncing against conscription. Upon his return he urged the immediate enactment of conscription and the Labor party split at once upon the issue, many members of the Commonwealth Parliament and some of the State representatives deciding for conscription, while the majority of the party opposed it. The programme of the Labor party in the three largest States, New South Wales, Queensland, and Victoria, involved opposition to conscription, and in New South Wales, from which Mr. Hughes was a representative, the Political Labor League expelled him from membership. Four members of the Commonwealth cabinet resigned on account of the Premier's conscriptionist policy and anti-conscriptionists also resigned from State cabinets that favored conscription. Before the referendum, the government, counting on success at the polls, drafted single men between the ages of 21 and 35, under the provision empowering it to do so for home defense, but with the ulterior design of dispatching them to the overseas service. On the one hand the conscriptionists argued that Australia being the most democratic of all countries had the most to fear from German domination. On the other the opponents of conscription advanced many objections, ranging from the Socialist condemnation of war in general to the contention that Australian independence was menaced. It was feared that married men would be drafted, and that there would not be enough workers left to carry on the food-producing industries. Australia had already enlisted 320,000 men for war service. The arrival of a ship load of Maltese laborers aroused the suspicion that the contract labor law was being evaded, and that well-paid Australian workmen would be drafted into military service and their places filled by cheap alien laborers. The bill for the referendum passed the Australian House of Representatives on September 21st, and the question was submitted to the voters on October 28th. The number who had voluntarily enlisted was 103,000 and the number that it was estimated would still be needed by July 1, 1917, was 100,000. Available men, that is the "fit, single and without dependents," were placed at 125,000. The government wished to resort to conscription only to supplement the voluntary enrollment, which was to be continued. Enough men to supply the deficit were to be called by conscription month by month. The age limit was 21 and the following classes were to be exempt: (1) Only sons; (2) single men who were the sole supports of dependents; (3) families from whom a member had volunteered to be exempt for one-half of the remaining members.

There were to be military courts to hear appeals for exemption. The vote on October 28th was against the measure. Figures published on November 6th showed a majority of 73,000 against conscription out of a total of 2,087,000 votes counted. This was explained by the democratic dislike of coercion, by the belief that the war was nearly over, and by the dissension in the Labor party as to methods of execution.

**THE GOVERNMENT WHEAT BOARD.** Among the important economic measures taken as a result of war conditions may be mentioned the Federal control of the wheat supply. Toward the close of 1915 it was announced that the government would take complete control of the wheat crop. It was to use the existing machinery for distribution, employing the present wheat agents, selling firms, and shipping companies. The management was vested in a central committee consisting of the Prime Minister, and the ministers for agriculture in Victoria, New South Wales, South Australia, and West Australia. There was much discussion of the advance price fixed for the farmers and some criticism, but of details rather than principle, for the fixing of prices had been going on for more than a year, boards for that purpose having been in operation in every State. Early in March the Commonwealth Wheat Board fixed the price of grain for millers at 4s. 9d. per bushel, which caused much complaint among the farmers as unfair. This was followed by the announcement of a fixed price for flour and bread.

**INDUSTRIAL UNREST.** During the first quarter of 1916 the number of labor disputes, according to the figures published, was double that of the corresponding period in the year before, though only half as large as during the quarter immediately preceding. The increase of labor difficulties in the country where conditions of labor are especially favorable gave rise to much discussion of the causes. A great many of the applications to wage boards for increase of wages in 1915 and 1916 were due to the high cost of living, but there were other more permanent causes alleged for the general situation. For example, it was pointed out that an active, progressive labor community in possession of political power, possessing a widespread popular system of education and a very high degree of industrial education would naturally raise its demands in proportion to its higher standard of living. Delays in the awards of wage boards were a fruitful source of unrest. An instance was cited in 1916 of one wage board that had taken two years to render a decision and of another that had taken five months. As awards were generally made for a period of three years, further delay was naturally exasperating. During the war there was also considerable delay as a result of the scarcity of legal or technical advisers. Again the decisions of the Commonwealth Arbitration Court were often rendered only after long delay and many of them were based on highly technical grounds, causing further dissatisfaction. Finally the difficulty had been accentuated by the dissension between the industrialist and parliamentary members of the Labor party. The former were dissatisfied with the moderate policy of the parliamentary group, and demanded more aggressive action. They were supported by the more energetic element in the party at large. The Industrial Workers of the World also played a part in stirring up

labor troubles, though it had not yet become strong in numbers or apparently acquired much influence over the main body of the Labor party, for some of its chief members were defeated for nomination as Labor candidates. For Australia's part in the great war, see the article **WAR OF THE NATIONS.**

**AUSTRIA-HUNGARY,** or the **AUSTRO-HUNGARIAN MONARCHY.** A monarchy of central Europe, consisting of the Austrian Empire, the Hungarian Kingdom, and the territory of Bosnia and the Herzegovina. The capital of Austria is Vienna, and of Hungary, Budapest. The examining and advisory body known as the Delegations, and acting for Austria and for Hungary in respect of their common affairs, convenes alternately at Vienna and Budapest. The permanent residence of the sovereign is Schönbrunn Castle at Vienna.

**AREA AND POPULATION.** The area of the monarchy is 261,241 square miles, which is somewhat smaller than the State of Texas. The population in 1916 was probably in excess of 52,500,000.

The population of the monarchy in 1910, exclusive of foreigners in Austria and the military in Bosnia and the Herzegovina, is stated at 50,748,403. Of these, German was the vernacular of 12,010,669; Magyar, 10,067,992; Bohemian, Moravian, or Slovak, 8,475,292; Croatian or Serbian, 5,545,531; Polish, 5,019,496; Rumanian, 3,224,755; Italian and Ladin, 804,271. Foreigners in Austria in 1910 numbered 608,062 (against 517,903 in 1900).

In 1910 Austria had 151 cities and towns with more than 10,000 inhabitants, and 7 with more than 100,000; Hungary proper, 85 and 2; Croatia and Slavonia, 7 with more than 10,000. Vienna had 2,031,498 inhabitants at the 1910 census, and Budapest 880,371.

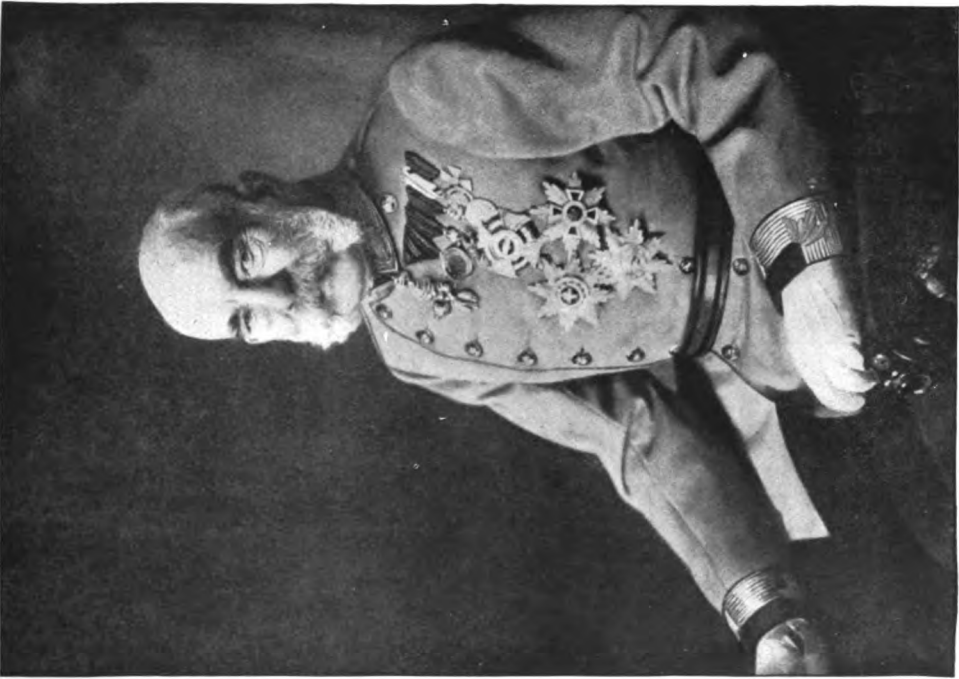
Marriages, births, and deaths are shown in the following table:

		Marriages	Births		* Deaths
			Living	Still	
Austria	1910	214,970	923,545	23,275	602,046
	1911	217,378	898,702	22,243	628,805
	1912	212,187	903,407	22,275	592,426
	1913	195,524	863,690	.....	588,654
Hungary	1910	179,537	742,899	15,667	490,689
	1911	193,482	732,767	15,149	524,496
	1912	182,373	765,891	16,840	491,722
	1913	195,030	735,626	15,891	500,875
Bos.-Herz.	1910	20,651	77,167	176	51,834
	1911	20,763	76,693	213	49,622
	1912	16,323	81,994	178	48,416
	1913	.....	† 82,333	...	‡ 54,473

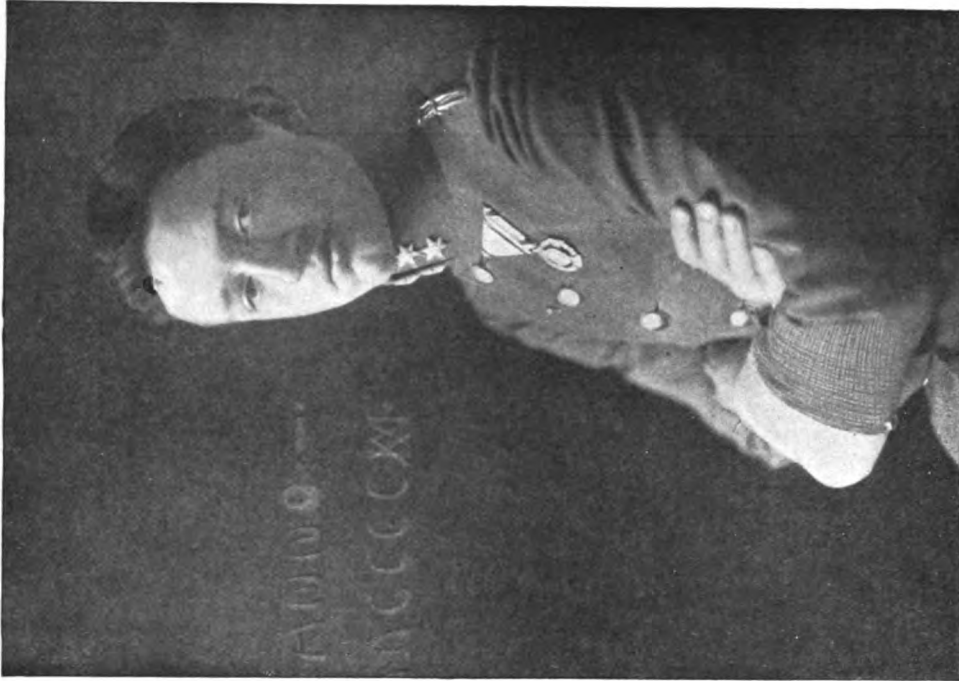
\* Exclusive of stillbirths. † Total births. ‡ Inclusive of stillbirths.

In Austria the marriage rate per thousand inhabitants was 7.38 in 1912, as compared with an average of 7.86 in 1901-5; living birth rate, 31.41 and 35.64; illegitimate living birth rate, 3.71 and 4.57; stillbirth rate, 0.77 and 0.97; death rate, 20.60 and 24.29; rate of excess of living births over deaths, 10.81 and 11.35. The actual number of living births in excess of deaths in 1912 was 310,981, as compared with an average of 304,030 in 1901-5. The percentage of illegitimate births was 11.82 in 1912, varying from 3.93 in Dalmatia to 36.70 in Carinthia.

In Hungary the marriage rate was 8.6 in 1912, as compared with an average of 8.8 in 1901-5; living birth rate, 36.3 and 37.4; percentage of stillbirths, 2.1 and 2.0; percentage of illegiti-



**EMPEROR FRANCIS JOSEPH**  
Died November 21, 1916



**EMPEROR CHARLES I**  
Successor of Francis Joseph

AUSTRIA-HUNGARY





mate births, 9.2 and 9.4; death rate, 23.3 and 26.4. The excess of living births over deaths in Hungary was 234,751 in 1913 and 274,169 in 1912, as compared with an average of 217,097 in 1901-5. The percentage of illegitimate births in Hungary in 1913 was 9.1; in Hungary proper, 9.3; in Transylvania, 9.9; in Croatia and Slavonia, 7.7. The highest percentage of illegitimate births was in Budapest and Agram, each with 27.2.

Oversea emigration in 1913 is reported at 309,950 (from Austria, 194,462). The United States was the destination of 254,825; Canada, 29,460; Argentina, 24,085. In the five-year period 1909-13, oversea emigration amounted to nearly 1,242,000.

**EDUCATION.** Elementary instruction is free and compulsory in both Austria and Hungary. In 1912 children of school age in Austria numbered 4,947,724; pupils at school, 4,471,393; elementary schools, 23,247 (including 1285 private schools); teachers, 107,374; training colleges, 149. German was the language used in 8508 elementary schools in 1912; Czech, 5367; other Slav languages, 7809; Italian, 697; Rumanian, 185; Hungarian, 5; other languages, 4; more than one language, 278.

For secondary education, the gymnasias and realschulen (including certain private schools) numbered 370 and 148 respectively in 1913-14, the former having 111,861 students and the latter 48,892. Forty of the gymnasias were for female students, who numbered 5871.

At each of the seven government technical high schools, teachers and students were as follows in the winter semester of 1913-14: Vienna, 183 and 3177; Prague (German), 86 and 900; Prague (Bohemian), 151 and 2817; Brunn (German), 102 and 924; Brunn (Bohemian), 73 and 569; Graz, 54 and 817; Lemberg, 98 and 1791; in addition, the Vienna agricultural high school had 86 teachers and 1135 students. In Austria eight universities are maintained by the government; teachers and students in the winter semester of 1913-14 were as follows: Vienna (German), 666 and 10,310; Prague (German), 225 and 2282; Prague (Bohemian), 249 and 4713; Graz (German), 199 and 2203; Innsbruck (German), 139 and 1480; Lemberg (Polish), 186 and 5871; Cracow (Polish), 195 and 3444; Czernowitz (German), 61 and 1194. Of the total number of students at the Austrian universities in 1913-14, about 8.5 per cent were women. University attendance declined rapidly after the beginning of the great war. Teachers and students at the University of Vienna in the summer semester of 1915 are reported to number 638 and 5160 respectively: Prague (German), 174 and 878; Graz, 168 and 784; Innsbruck, 115 and 649.

In Hungary in 1913 public instruction was provided in the following institutions: 2162 infant schools, 18,507 day elementary schools, 540 higher primary schools, 107 normal schools, 197 gymnasias, 49 realschulen, 35 higher schools for girls, 4 universities, 10 law colleges, 47 theological schools, 72 special schools of mining and agriculture, 200 special schools of industry and commerce, and other establishments. In the 16,861 day elementary schools in Hungary proper, there were at the end of the school year 1912-13 1,937,814 pupils (these figures include 246 private schools with 18,018 pupils); total enrollment for the year, 2,079,867.

The University of Budapest had 7808 students

at the end of the winter semester, and 7126 at the end of the summer semester, of 1912-13. See AGRICULTURAL EDUCATION.

**AGRICULTURE.** The average annual yield of wheat during the period 1905-14 is calculated at about 16,072,000 metric quintals in Austria and 46,072,000 in Hungary (one quintal = 220.46 lbs.); rye, 26,763,000 and 12,759,000; oats, 22,828,000 and 12,733,000; corn, 3,988,000 and 45,330,000; barley, 16,322,000 and 15,070,000; sugar beets, 63,871,000 and 30,353,000; potatoes, 132,848,000 and 52,864,000; hops, 135,560 and 9530; tobacco, 66,950 and 670,350; hemp fibre, 176,600 and 590,000; hemp seed, 134,500 and 230,900; flax fibre, 349,300 and 130,600; linseed, 236,700 and 58,000; rape seed, 246,800 and 216,000; wine, 4,776,000 and 4,481,000 hectolitres (one hectolitre = 26.4178 gallons); silk cocoons, 2,214,000 and 1,767,000 kilograms (one kilogram = 2.2046 lbs.). The area in hectares (one hectare = 2.47104 acres) and the yield in metric quintals are reported as follows for some of the more important crops in Austria (excluding Galicia and the Bukowina in 1914):

	Hectares		Quintals	
	1913	1914	1913	1914
Wheat	1,212,892	671,980	16,227,547	10,848,573
Rye	1,968,602	1,269,702	27,044,707	18,988,084
Barley	1,092,181	699,744	17,501,568	12,727,946
Oats	1,904,718	1,147,189	26,773,770	19,176,435
Corn	285,531	189,668	8,879,655	2,736,083
Su. beets	254,689	242,646	69,619,875	67,748,491
Potatoes	1,275,651	717,767	115,519,419	77,584,278

Similar figures for Hungary (including Croatia and Slavonia):

	Hectares		Quintals	
	1913	1914	1913	1914
Wheat	3,483,206	3,790,000	45,789,786	30,741,000
Rye	1,281,496	1,188,000	18,023,917	11,801,000
Barley	1,251,496	1,176,000	18,023,917	14,682,000
Oats	1,270,652	1,147,189	15,881,544	11,801,000
Corn	2,918,767	2,434,252	53,603,084	43,768,820
Su. beets	182,088	177,744	48,650,428	40,148,083
Potatoes	691,051	612,449	54,506,086	53,143,261

**MINING AND METALS.** For Austria no later figures for mineral production can be had than those given in the preceding YEAR BOOK, but some further details may be added. As noted in the 1915 volume, the value of mining products (exclusive of salt, petroleum, etc.) was 371,442,426 kr. in 1913. The share of Bohemia in the 1913 mining output was valued at 175,452,092 kr. (lignite 110,023,337, coal 47,637,749, iron ore 11,784,850, silver ore 3,865,466); Silesia, 79,858,949 kr. (coal 79,853,252 kr.); Styria, 46,219,005 kr. (lignite 29,105,724, iron ore 16,208,400, graphite 791,081); Moravia, 26,616,049 (coal 24,937,859, lignite 1,013,249, graphite 630,149); Galicia, 18,864,865 kr. (coal 16,702,192, lead ore 1,484,269); Carinthia, 7,813,545 kr. (lead ore 4,508,167, zinc ore 1,739,849, lignite 1,019,987); Carniola, 6,548,767 (lignite 3,350,428, quicksilver ore 3,175,455). The production of petroleum (and ozocerite) in Galicia declined from 20,884,569 metric quintals in 1909 to 11,458,163 in 1912; the value, however, increased from 34,928,285 kr. to 59,695,236 kr. The 1912 output consisted of 11,441,332 metric quintals of petroleum, valued at 57,234,546 kr., and 16,831 quintals of ozocerite, valued at 2,460,690 kr. The output of refined or prepared salt in 1913 was 3,375,629 quintals, valued at 46,313,806 kr.

Of the salt 1,518,146 quintals, valued at 17,415,028 kr., were produced in Galicia, and 1,011,917 quintals, valued at 16,689,565 in Upper Austria. For 1915 the output of coal is reported at 16,083,000 metric tons, and lignite 22,027,100 tons.

The value of furnace products in Austria was 181,607,752 kr. in 1913. These products included in 1913: Raw iron, 1,757,864 metric tons, valued at 143,457,727 kr.; lead, 22,312 tons, 10,706,814 kr.; zinc, 19,508 tons, 10,366,981 kr.; copper, 3685 tons, 5,986,409 kr.; silver, 54,433,487 kilograms, 5,264,916 kr.; gold, 283,587 kilos, 919,773 kr. The share of Styria in the furnace products of 1913 was valued at 50,875,441 kr. (raw iron 48,385,776, zinc 2,483,598); Moravia, 41,810,243 kr. (raw iron 39,990,055, copper 1,490,032); Bohemia, 35,710,103 kr. (raw iron 28,187,476, silver 4,348,911, lead 1,940,030); Silesia, 14,978,008 (all raw iron); Trieste, 11,173,002 (all raw iron); Galicia, 9,384,017 (zinc 7,883,383, lead 1,174,472); Carinthia, 6,542,965 (lead 6,404,987); Salzburg, 5,237,054 (copper 4,309,060); Carniola, 5,141,768 (quicksilver 3,878,600, lead 1,187,325).

In Hungary, the average annual value of mining and furnace products in the period 1901-5 was 104,187,000 kronen; in 1906-10, 139,208,000 kr.; in the year 1911, 160,276,000 kr.; in 1912, 167,830,000 kr.; in 1913, 185,657,000 kr. These figures, and those also in the table below, do not include the original value of ore that has been smelted into metal whose value is included. The quantity (in metric tons) and the value (in thousands of kronen) of the more important mining and furnace products of Hungary were as follows in 1912 and 1913:

	Metric Tons		1000 Kronen	
	1912	1913	1912	1913
Lignite .....	8,131,307	8,801,160	78,974	88,257
Raw iron .....	552,839	622,952	46,447	53,956
Coal .....	1,079,097	1,058,877	13,661	14,394
Gold .....	* 2,852	* 2,924	9,854	9,586
Iron ore for export	591,586	551,734	5,651	5,816
Coke .....	149,918	160,073	4,816	4,469
Coal briquette .....	118,505	117,186	2,199	2,259
Iron pyrites .....	103,809	106,629	1,062	1,118
Silver .....	* 10,782	* 8,696	1,023	820
Antimony .....	859	1,048	505	616
Copper .....	242	405	879	612
Bitumen .....	4,460	3,025	677	511

\* Kilograms.

COMMERCE. Authentic details of Austro-Hungarian foreign commerce are available not later than for the year 1913. In the 1914 special trade of the common customs territory, total imports are reported at about 2,753,184,000 kronen, and total exports at about 2,015,904,000 kr.

SHIPPING. The merchant marine of Austria is reported to have included on Jan. 1, 1914, 198 sea-going vessels of 451,150 tons, as compared with 192 of 407,016 tons on Jan. 1, 1913. The reported number of Austrian coasting vessels on the latter date was 1603 of 35,428 tons, and of fishing boats, etc., 14,969 of 28,808 tons. Of the total 1914 tonnage, 422,368 tons were steam. The merchant marine of Hungary in 1913 consisted of 545 vessels of 144,433 tons; of these, 68 were sea-going steamers of 131,763 tons. In 1913 there were entered at Austrian seaports 173,511 vessels of 27,877,722 tons; of these, 161,088 of 25,445,061 tons (i.e., 91.27 per cent) were

Austro-Hungarian. Cleared at Austrian seaports in 1913, 173,377 vessels of 27,857,112 tons; of these, 161,282 of 25,417,590 tons (91.24 per cent) Austro-Hungarian. Entered at Hungarian (including Croatian) seaports in 1913, 31,857 vessels of 4,930,905 tons; cleared, 31,836 vessels of 4,924,734 tons. Trieste and Fiume are the principal merchant seaports of Austria-Hungary.

COMMUNICATIONS. Besides the railways the Danube River and its affluents are important avenues of transportation in Austria-Hungary. The length of railway in operation on Jan. 1, 1914, is reported at 47,199 kilometers (29,328 miles), of which 23,787 km. in Austria, 21,870 km. in Hungary, and 1942 in Bosnia and the Herzegovina. Most of the railway is under government operation. In Austria at the end of 1912, the length of telegraph lines (including government, railway, and private lines) was 47,192 km.; length of wire, 238,918 km.; offices, 7088. The government lines included 40,581 km.; wire, 157,629 km.; offices, 4717. In Hungary in 1913 there were 26,388 km. of telegraph line, with 160,712 km. of wire and 5171 offices (of which 2801 were government offices). The length of telegraph line in Bosnia and the Herzegovina in 1913 was 3501 km., with 10,627 km. of wire and 321 offices. Post offices in 1913: In Austria, 9985; in Hungary, 6610; in Bosnia and the Herzegovina, 249; in foreign territory, 36.

FINANCE. The standard of value is gold. The monetary unit is the krone (crown); its par value is 20.263 cents. The cost of administering the common affairs of the monarchy is borne by Austria and by Hungary in a proportion agreed to by their parliaments and sanctioned by the Emperor-King. The agreement renewed for ten years in 1907 provides that the net proceeds of the common customs be applied to the common expenditure, and that the remaining expenditure be satisfied in the proportion of 63.6 per cent by Austria and 36.4 per cent by Hungary. Authentic information covering government revenue and expenditure since 1914 is not accessible on account of the great war. The budget estimates for the year ending June 30, 1915, for the common government were as follows, in thousands of kronen: Expenditure, 778,244; customs revenue, 216,455; and the contributions from Austria and Hungary, 357,298 and 204,491, respectively.

In the following table are shown the revenue and expenditure, in thousands of kronen, of the Austrian government and the Hungarian government:

	Austria		Hungary	
	Rev.	Expend.	Rev.	Expend.
1908 ...	2,388,384	2,373,894	1,531,868	1,616,245
1909 ...	2,795,703	2,888,648	1,750,783	1,721,564
1910 ...	2,895,492	2,901,364	2,074,548	1,901,666
1911 ...	3,082,732	3,004,035	1,830,780	1,768,849
1912 ...	3,173,309	3,184,861	1,954,877	2,018,261
1913 ...	3,486,079	3,461,133	2,072,809*	2,072,754*

\* Estimate.

In Austria, the estimated revenue, according to the budget for the year ending June 30, 1915, amounted to 3,460,987,902 kronen (3,194,355,951 kr. ordinary, 266,631,951 kr. extraordinary), and the estimated expenditure 3,460,726,156 kr. (3,064,672,060 kr. ordinary, 396,054,096 kr. ex-

traordinary). In Hungary, the estimated revenue for the year ending June 30, 1915, was 2,264,157,883 kr. (1,953,605,613 kr. ordinary), and the estimated expenditure 2,264,096,830 kr. (1,876,270,912 kr. ordinary). In Bosnia and the Herzegovina, the estimated revenue and expenditure for 1913 were 92,997,594 kr. and 92,987,887 kr. respectively.

According to the terms under which the union of Austria and Hungary was effected in 1867, no debts are contracted by the common government. The total general debt, contracted before that date, amounted on Jan. 1, 1915, to 5,124,820,435 kr., of which 5,096,866,315 kr. formed the consolidated debt. The Austrian debt increased from 7,467,346,388 kr. on Jan. 1, 1914, to 12,836,044,942 kr. on Jan. 1, 1915. Of the latter sum, the consolidated debt comprised 7,131,951,135 kr.; during the year the floating debt increased from 347,135,730 kr. to 5,704,093,807 kr. The Hungarian debt in 1912 was 5,520,569,583 kr., besides arrears and outstanding paper amounting to 1,072,276,486 kr. This debt, like the Austrian, has increased enormously since the beginning of the great war. See FINANCIAL REVIEW.

**GOVERNMENT.** Under the constitutional compromise of 1867, the administration of the monarchy is directed by the Emperor-King, acting through three ministers, for foreign affairs, finance, and war. The admiralty is a department of the ministry of war. The ministers are responsible to the two Delegations; these bodies, consisting of 60 members each, are elected by the Austrian and Hungarian parliaments respectively and convene each year, alternately at Vienna and Budapest. They examine the requirements of the common services of the monarchy and advise the parliaments as to necessary appropriations. The common government deals with finance relating to the monarchy as a whole, foreign affairs, the diplomatic, consular, postal, and telegraphic services, and certain state monopolies. Austria and Hungary have each a representative parliament of two houses and a responsible ministry. The Austrian parliament is termed the Reichsrat, and the Hungarian the Országgyűlés. Each of the Austrian crownlands has a diet, and there is also a diet for Croatia and Slavonia. The administration of Bosnia and the Herzegovina is directed by the common ministry of finance.

The Emperor-King Francis Joseph I died Nov. 21, 1916. He was born Aug. 18, 1830, and became Emperor of Austria Dec. 2, 1848, and King of Hungary June 8, 1867. He was succeeded by the heir presumptive, the Archduke Charles Francis Joseph, born Aug. 17, 1887, son of the late Archduke Otto Francis Joseph, who was a nephew of Francis Joseph I. The new sovereign ascended the throne as Emperor Charles (Karl) I of Austria and King Charles IV of Hungary. Charles was married Oct. 21, 1911, to Zita, Princess of Bourbon of Parma, who was born May 9, 1892. The heir apparent of the new sovereign is the Archduke Francis Joseph Otto, born Nov. 20, 1912. The father of the Emperor-King Charles was a younger brother of the late heir presumptive, the Archduke Francis Ferdinand. The assassination of Francis Ferdinand and his morganatic wife, the Duchess of Hohenburg (Countess Chotek), by a Serb at Sarajevo, Bosnia, on June 28, 1914, was made by the Austro-Hungarian government the occasion of an uncompro-

misingly hostile attitude toward Serbia, which resulted in the Austro-Hungarian declaration of war on Serbia July 28th and the German declaration of war on Russia August 1st.

The common ministry early in 1916: Premier and minister for foreign affairs, Stephan Burian von Rajesz, appointed Jan. 14, 1915, in succession to Leopold (Count) von Berchtold; finance, Dr. Ernst von Koerber, appointed in February, 1915; war, Gen. Alexander (Ritter) von Krobatin, appointed Dec. 10, 1912. Premier of the Austrian ministry, Karl (Count) Stürgkh; Premier of the Hungarian ministry, Stephan (Count) Tisza. See below under *History*.

## HISTORY

**CABINET CHANGES.** Count Stürgkh (q.v.), the Austrian Prime Minister, was shot and killed at a hotel in Vienna on October 21st, by Dr. Friedrich Adler, son of the Socialist Deputy to the Reichsrat, Dr. Victor Adler. The murderer, who held very radical views and was reported to be of an unbalanced mind, admitted that he had acted merely from political motives. The Premier's refusal to convoke parliament was thought to have precipitated the act. Herr von Koerber, former Premier and reputedly of Pan-German tendencies, succeeded to the office and his continuation was approved by the new Emperor, but his ministry lasted only till December 13th. The causes of his resignation were not known and were the subject of much speculation in the press, some saying that von Koerber wished to reassemble the Reichsrat, while a group of Radicals headed by Herr Wolf were opposed—a doubtful theory, since the opposition of the Radicals had been pronounced when the ministry was formed (November 1st). Others held that Germany was insisting on the cession of Triest by Austria to Italy and that von Koerber had resigned in disapproval. But this too seemed improbable since the retention of the port of Triest was essential to German domination in middle Europe and even more important to Germany than to Austria. Still others saw in it a rupture between the Count Tisza, Baron von Burian and the Magyars on the one hand, and von Koerber and the Austrian element on the other. They took it as an additional sign of the growing Hungarian ascendancy. Toward the end of December it was announced that Count Clam Martinitz had been invited to form a ministry. He was described as an aristocrat of ancient Czech family, friendly to the Czechs and ill-disposed to Germany, as opposed to Hungarian supremacy, and as favoring the creation of a triple monarchy of which Austria, Hungary, and Poland should be the constituent parts. Two German ministers, however, were included in the cabinet. The new ministry announced its determination to convoke parliament and to prepare for closer economic union with Hungary. It also announced measures of succor for soldiers' families and gave assurance to the people of abundant supplies. Late in December, 1916, it was reported that Krobatin was to be replaced by Field Marshal von Schleyer.

**THE DEATH OF THE EMPEROR.** The aged Emperor Francis Joseph (q.v.) died on November 21st at nine o'clock in the evening at Schönbrunn. His death was unexpected, for his health

had seemed normal and until the day before he had been able to attend to his duties. He was succeeded by his grand-nephew, the Archduke Charles Francis Joseph (q.v.) who took the title of Charles I.

**THE CORONATION IN HUNGARY.** The coronation of the Emperor at Budapest on December 30th as King Charles of Hungary, an exclusively Hungarian ceremonial, was remarkable in the history of the kingdom for its magnificence. Crowds had gathered from all parts of the country. Along the route of the procession windows were said to have been rented for prices as high as 5000 crowns, and in one instance for 21,000. The royal diploma was presented to the King by a deputation of both Houses, December 28th, and on the following day the King, having signed it, sent it to the Parliament. He then took the oath. At the ceremony the King wore the regalia of a field marshal and was surrounded by the captains of his bodyguard. The members of both Houses, all wearing the national costume, met in a single assembly. One of the first acts of the new King was the appointment of two new guardians for the crown. He voluntarily announced his intention of passing half the year at Budapest and half at Vienna. Owing to the dissatisfaction with the late Emperor's long absences from his Hungarian capital there had been talk of making this even division of time compulsory.

**THE HUNGARIAN PARLIAMENT.** In June occurred a sharp debate on the war in which the government was criticized by members of the Opposition for the military blunder which had sacrificed the Bukovina to the Russians and later in the month several of the leading deputies voted against the provisional budget, showing thus their disapproval of the government's failure to conclude peace, now that the defensive purposes of war had been attained. In July there was further trouble between the government and the Opposition, and Count Tisza, Premier, finally declared the government's willingness to receive the advice of its critics. Later, however, the group headed by Count Michael Karolyi, whose aims were more radically democratic than the bulk of the Independent party, withdrew from the latter and with some disaffected members of other groups, formed a new Independent party which began a vigorous campaign against the ministry, resulting in stormy scenes in the Diet in the session of September 5th and in several following sessions. Count Bela Sereny, member of the government party, resigned his office as Secretary of Agriculture on September 13th. The ministry having received from the Emperor a decree proroguing the Diet, threatened to issue it if the Opposition went to extremes. The latter demanded an investigation at the hands of the Austrian and Hungarian Delegations of the conduct of the government and of the administration of the army in regard to Rumania. They blamed the ministry for not having averted Rumania's entry into the war, for the Rumanian invasion of Transylvania, and for the scarcity of food. But upon the Premier's refusal to accept this demand, the Diet on September 22nd rejected the Opposition motion which had been brought for this purpose. The demands of Count Karolyi were reported on October 7th to be as follows: The dismissal of Count Tisza, the creation of an independent Hungarian army and economic in-

dependence, an independent tariff and bank, and universal suffrage for Hungary. At the end of the year there were reports of the growing insecurity of the Tisza ministry. There were conferences between the leaders and the Emperor, and there was some talk of Count Zichy as his successor.

**SOCIAL AND ECONOMIC CONDITIONS.** Not much trust could be placed in the fragmentary reports as to internal conditions of the Empire, for so far as they went into detail they were derived exclusively from sources controlled by the Entente Powers. Yet from the increasing frequency of the reports as to food scarcity, it seemed probable that the situation was becoming worse. A Socialist journal, the *Arbeiter-Zeitung*, after publishing statistics to show that conditions had become much more serious during the year, pointed out that vegetables were extremely scarce, meat was sold at an exorbitant price, and eggs were not to be had at all. Among the reasons given were the prohibition of imports in certain provinces and the course of the peasants in reserving for their own families very large supplies. There was also a failure in the milk supply owing to scarcity of forage and the decrease in the number of cows. In September a department for the regulation of the food supply was decided upon by the government and its organization was announced early in the following month. Certain journals commented on the measures taken by the food supply controller as extreme and arbitrary. He was reported to have issued an ordinance requiring each department to supply a certain quantity of grain at a certain date and in default of the required amount, as ordering the prefect to diminish the rations either to the population in general or to children alone. Reports of travelers in December referred to serious shortage of food both at Budapest and at Vienna. In Hungary toward the close of the year there were reports of great difficulty in preserving order. In certain places where the police force to a large extent had been enrolled in the army the local administrations had to avail themselves of the voluntary services of civilians. Criminality was reported to be on the increase and the number of juvenile offenders was said to be especially large. Certain highways were so unsafe that travelers did not venture on them unless armed. The Austrian journals reported with congratulations the final capture of a band of brigands which had terrorized several of the departments on the right bank of the Danube. To do this it had been necessary to call out several battalions of regular troops. See PRICES.

**MISCELLANEOUS.** In the summer charges of high treason and espionage were brought against Dr. Kramersch, a leader of the Young Czech party, Dr. Rozenhaim, member of the Diet, and two other members of the Hungarian Czech party. They were accused of a plot for the purpose of uniting Bohemia with Russia. Another treason case was reported in August. The accused were four deputies of whom the principal was Professor Masanyk. The charge against the latter was that of high treason, and against the others of being accessory. Professor Masanyk succeeded in making his escape but the others were convicted on August 21st and sentenced to terms of imprisonment ranging from one year to five years. In July the Finance Minister, Vileozky, said that the war had cost

on an average 450,000,000 crowns a month and was then costing 600,000,000 crowns a month. Subscriptions to the fourth loan, amounting to 1,200,000,000, were received. Great loss of life and damage was caused on September 19th by the bursting of a dam near Gablonz, Bohemia. The dam, which was completed in 1915, had a capacity of 400,000 cubic meters and was connected with a basin which had a capacity of 7,000,000. The flood spread over seven villages in the glassware district, causing 250 deaths and destroying many buildings. See **MILITARY PROGRESS; NAVAL PROGRESS; WAR OF THE NATIONS.**

**AUSTRO-GERMAN RELIEF FUNDS.** See **RELIEF FOR WAR VICTIMS**, section so entitled.

**AUTHORS' LEAGUE OF AMERICA.** The League is a business association of authors and others identified with the production of books, and of persons in artistic work. It is intended to result in mutual service, benefit, and protection. Writers, whether of novels, poems, stories, essays, or educational books, also writers of dramas and photo-plays, painters, illustrators, composers, sculptors, and photographers may become regular members. Among the associate members are publishers, theatrical managers, literary and dramatic agents. Through its collection, registration, employment, business, and copyright bureaus, the League is able to serve its members in various ways, especially by advice in the matter of contract, aid in collecting accounts due, and assistance in securing copyrights. The League is not simply a business association, but has frequent meetings of a social character.

The officers for 1916-17 are: President, Winston Churchill; vice-president, Theodore Roosevelt; secretary and treasurer, Eric Schuler; counsel, B. H. Stern.

**AUTOMOBILES.** The automobile industry in the United States in 1916 attained extraordinary dimensions and the demand for pleasure and commercial vehicles continued unabated. The increased price of gasoline (see **PETROLEUM**) introduced problems in operation and design and was reflected by changes and improvements in the carburetors so that it was possible to use with advantage the lower grade fuels that petroleum refiners were putting on the market. In 1916 it was realized that the gasoline automobile mechanism, so far as its essential principles were concerned, had reached a point where the great majority of machines embodied the same fundamental principles, and at the same time perfection of processes of manufacture and of the details of the machines themselves figured more than the evolution of new designs. Comfort for the passenger and ease of handling were perhaps two leading considerations. Indeed it was said for American designers and manufacturers that whatever the type or cost of the car, whether it was \$500 or \$5000, engine or chassis failure from poor design was practically unknown.

At the end of the year there was a tendency to increase the wheel base to give roomier bodies with wider and deeper seats. Combination summer-winter bodies were in wide vogue, especially with a non-folding permanent top supported by four posts at the front and rear of the car. In touring cars there was a tendency to use but one door on each side and separate the front seats, making them in the form of individual chairs with a passageway between. This arrangement was also adopted with favor for what formerly were two- or three-passenger roadsters. A ten-

dency of 1916 was to reduce the height of the body by placing the seats lower and thus reduce the centre of gravity even at the necessity of providing a longer wheel base. This made an easier riding car. The design of the bodies for touring cars approximated the stream line form as far as possible, and both over the power plant from radiator to windshield and along the sides of the body itself unbroken lines were the rule.

In regard to engines in 1916 there were no marked development or predominance for any single type. More new cars were equipped with 6-cylinder engines than in the previous year and for the best cars this type was a competitor of the 8- and 12-cylinder engines in popular favor. The preference was perhaps for small bore, high speed 6-cylinder engines with an average rating of about 35 horse power.

The great problem in engine design in 1916, not altogether solved, was to find some means of utilizing the less volatile petroleum products, such as kerosene. To use in motor cars kerosene and even lower grade oils in connection with standard motors involved a proper device to proportion the feeding of air and fuel as is done for gasoline by the carburetor, and also some means of heating and vaporizing fuel that was not volatile enough to vaporize itself. In most of the experimental work the appliances under test usually consisted of two parts: one for starting, and the other for running. The first operation of course presented the chief difficulty and attempts were made to solve it either by a separate supply of gasoline or by heat from an oil burner. The heat for vaporization in running would be supplied from the exhaust. With such lower grade fuel it was thought that the combustion space in the cylinder would have to be increased either by raising the heads or by decreasing the length of the connecting rods.

**STATISTICS OF PRODUCTION.** In 1916 according to statistics of the National Automobile Chamber of Commerce, the total American production of all classes of cars was 1,617,708, of which 1,525,578 were passenger automobiles and 92,130 trucks or commercial vehicles. This was the first year in which the American production had passed the million mark. The total value of this output, based on the retail price, was \$1,088,028,273, represented by \$921,378,000 in passenger cars and \$166,650,273 in trucks.

In 1915 the total output of cars was 892,618, valued at \$691,778,950; the gain in production over the preceding year was, therefore, 80 per cent, and this increase was twice as much as the average annual gain since the foundation of the industry. In 1915 there were sold 842,249 passenger cars, valued at \$565,856,450. The output of motor trucks in 1915 was 50,369, valued at \$125,922,500.

The average retail price of passenger cars in 1916 was \$605, as compared with \$672 in 1915. In the first 10 months of 1916 67,618 cars and trucks were exported, as compared with 53,380 in 1915. An estimate for the 12 months of 1916 was 78,200 cars exported.

The estimate of motor vehicles in use in the United States on Dec. 31, 1916, was 3,500,000 and there was frequent discussion as to when the saturation point would be reached for the country. In New York State alone, in 1916, 446,205 licenses were issued, of which number 313,583 were owners, representing 279,930 pleasure cars and 34,653 commercial cars, while 2494 were

dealers and 25,812 motor cyclists. In New York State 104,414 chauffeurs were licensed.

**CENSUS REPORT.** The statistics of the 1914 census for manufactures, issued by the Bureau of the Census and announced in 1916, show the exact extent of the growth of the automobile industry from 1909 to 1914. These were the latest official figures, but they had little value in connection with the status of the industry in 1916.

In 1914 there were 300 establishments engaged primarily in the manufacture of motor vehicles. They employed 79,307 persons, had an invested capital of \$312,876,000, paid \$84,901,000 in salaries and wages during the year, and produced vehicles to the value of \$503,230,000.

In addition, there were 33 establishments engaged in other lines of manufacturing which produced automobiles to the value of \$6,636,920.

Adding the value of bodies and parts produced by 971 companies making this their principal business and 434 other establishments producing them as a side line, brings the total value of automobile products for 1914 to \$649,982,990 — an increase of 153.9 per cent over the value of production of \$254,447,346 in 1909.

**MOTOR TRUCKS.** Naturally there was a heavy demand for motor trucks from the belligerent nations as well as in the United States, but there was little change in design in 1916, and improvements were in the direction of much needed standardization and more economical production. The military operations in the southwestern United States demonstrated the necessity of motor transport in modern warfare and in one case a record of 800 miles across roadless ground was made in 13 days by a motor truck. Motor batteries and motor tractors were extensively used in all military operations, and in Europe the so-called "tanks" or caterpillar tractors lent a new aspect to the war. See **MILITARY PROGRESS.**

The rapid and extensive general use of motor trucks involved many serious questions as regards the construction and maintenance of highway of all kinds, from the dirt roads of the rural districts to city pavements. The chief damage was done by the heavy trucks and trailers of contractors. With a rubber tire which can carry about 750 pounds per inch width the limit was reached and the motor vehicles themselves were not so injurious, but the trailers without rubber tires or springs were responsible for most of the damage. In New York, outside of the State law which had proved quite inadequate, there was little or no adequate regulation of motor trucks and a change of motor truck fees based "upon the time and extent of the vehicles' use of the public highways, and the relative wear and tear of the highways resulting from their use" was under consideration by a commission appointed by the State Legislature.

In New Jersey certain restrictions on motor truck traffic were suggested to protect the State's highways from unreasonable use. The tentative schedule prepared as a forerunner of legislation sought to restrict size, weight, and speed. In other States the heavy cost of upkeep for the highways was bringing the matter also to a focus and one of the immediate tendencies was general legislation in this respect. See **ROADS AND PAVEMENTS.**

During 1916 steel automobile tires were being used in Germany on account of the scarcity of rubber, and were formed of fine steel threads woven together and fixed over an inner band of

rubber which remained intact even after the cover was worn off. The latter had to be replaced after 3500 miles. These steel tires were said to be a makeshift, and not only retarded speed but made rough riding.

**A NEW STEAM CAR.** The most striking novelty of the year was a steam car designed and built by Abner Doble of Detroit. Some of the earliest mechanical pleasure vehicles used in the United States were steam cars with flash boilers, but even in improved form they were unable to hold their own with gasoline engined cars. The advantages of steam, especially as regards power and flexibility, are as evident as its disadvantages, and with the simpler engine and ease of control it was necessary to consider the problem of eliminating the more serious difficulties, such as loss of water by evaporation and time consumed in raising steam. These two problems have been met by the condensation of all the steam used in a radiator similar to that of a gasoline car, so that 1500 miles can be run on a single filling, and using a carburetor and spark plug to produce a fuel mixture which will give an intense heat sufficient to raise steam in one and a half minutes from cold water. Lubricating oil is introduced into the water, so that it acts not only to lubricate the cylinders continuously and automatically, but prevents the formation of scale in the boiler. The engine proper is a simple una-flow double action, two-cylinder locomotive type steam engine with a bore of 5 inches and a stroke of 4 inches. The fuel, which is kerosene, is first mixed in a carburetor and then ignited by an electric spark in the combustion chamber, the air being forced by a blower through the carburetor. The boiler is of the water-tube type, formed of a number of sections each consisting of two horizontal headers connected by 16 vertical tubes, both tubes and headers being of cold drawn seamless steel tubing autogenously welded together. A mileage of 15 miles per gallon of kerosene was claimed for the new cars, and a run of 1000 miles on a single supply of water, while one gallon of lubricating oil would suffice for from 8000 to 12,000 miles. The test machine ran for three years and was found to develop power, flexibility, and reliability in addition to a simplicity of design which served for ready maintenance. The car was put out to sell as a medium price car with due regard for the economies of using a cheaper fuel which was burnt, not exploded.

**RACING EVENTS.** The year 1916 was notable for the speed attained in the automobile racing events. Of the 37 races held, 27 were finished in time which averaged more than 100 miles an hour. The average time for the entire 37 was 87.31 miles per hour, an increase over the preceding year of a little more than 12 miles an hour. If the road races are eliminated the average time was 92.48 miles per hour, the fastest in the history of the sport.

The individual racing honors of the year were won by Dario Resta, the Italian-English driver in his Peugeot car. Resta was victor in 6 of the 11 races in which he took part, including the Chicago Derby, the Indianapolis Sweepstakes, the Omaha Sweepstakes, and the Vanderbilt Cup. His prize winnings totaled \$51,550, to which must be added the Bosch Trophy, emblematic of the championship.

Johnny Aitken ranked second and proved the real speed king of the year. Aitken broke all

records by winning the Harkness Gold Trophy at the Sheepshead Bay Speedway on October 28th in the average time of 105.95 miles per hour for 100 miles. He also won the Astor Cup over the same course, his prize money for 1916 amounting to \$43,756. Eddie Rickenbacher captured third honors, his prize winnings being \$24,300. In the road races, which were probably held for the last time, Eddie O'Connell reigned supreme.

**AVIATION.** See AERONAUTICS; MILITARY PROGRESS.

**BABCOCK, STEPHEN.** An American educator of the blind, died May 19, 1916, in Yonkers, N. Y. He was born at Potter Hill, R. I., in 1832. At 19, having himself become blind, he entered the New York School for the Blind, with which, after graduating, he was connected for 50 years, as instructor, principal, and professor. He retired in 1904. At one time Grover Cleveland, later President of the United States, acted as secretary to Professor Babcock. The raised maps, used in teaching geography to the blind, were invented by him. He was connected with various organizations, being president of the Seventh Day Baptist General Conferences in 1905 and 1906 and treasurer of the American Association of Institutes for the Blind.

**BACCELLI, GUIDO.** An Italian physician, educator, and statesman, died Jan. 10, 1916. He studied medicine at the University of Rome, in which city he was born in 1832, and at his Alma Mater was successively professor of medical jurisprudence, pathological anatomy, and clinical medicine, which last chair he had held since 1863. Baccelli also served as director of the medical clinic in Rome. He was four times Minister of Public Instruction, and did much to reorganize the Italian educational system. From 1901 to 1903 he was Minister of Agriculture. Since 1875 he had sat in parliament as one of the deputies for Rome. One of his most important works is *Patologia del cuore e dell' aorta*.

**BACH FESTIVAL.** See MUSIC, *Festivals*.

**BACON, EDWIN MUNROE.** An American journalist and author, died Feb. 24, 1916, in Boston. He was born in Providence, R. I., in 1844, and entered newspaper work at 19, as a reporter on the *Boston Advertiser*. After experience in other cities, including Chicago and New York, Mr. Bacon returned to Boston, where he was editor in chief of the *Globe* (1873-78), the *Advertiser* (1883-86), and the *Post* (1886-91). In 1891 he retired to devote himself to literary work. Besides contributing to the *Springfield Republican* and the *New York Evening Post*, he published: *Boston* (1903); *The Connecticut River* (1906); *Rambles Around Old Boston* (1914); *Old Seaport Towns of New England* (1915); and he wrote the article on Boston in the *NEW INTERNATIONAL ENCYCLOPEDIA*.

**BACTERIA.** See CANCER.

**BAEKELAND, LEO HENDRIK.** See CHEMISTRY, INDUSTRIAL, *Medals*.

**BAGDAD RAILWAY.** See TURKEY, *Railways*.

**BAHAMAS.** The most northerly of the British West Indian colonies; a chain of about 20 inhabited islands and numerous islets and rocks. Total area, 4403½ square miles; population (1911), 55,944 (of whom 13,554 in the island of New Providence). The population is mostly negro. Nassau, or New Providence, is the capital. Sponges are the principal export (£110,740 in 1910; £148,319 in 1913). The

other products for export include preserved fruits (£8208 in 1913, £7535 in 1914), pineapples, oranges, and grapefruit. Area planted to sisal in 1914, over 20,000 acres; export, 5,605,143 pounds, valued at £46,685. In the following table revenue and expenditure are for fiscal years:

	1910	1911	1913	1914
Imports . . . .	2329,014	2358,111	2403,529	2367,524
Exports * . . .	188,286	276,115	263,954	223,491
Revenue . . . .	84,886	97,574	100,753	76,911
Expenditure . .	85,315	88,077	96,496	102,208
Shipping † . .	1,722,340	1,247,844	1,747,779	1,250,762

\* Of colonial produce. † Tonnage entered and cleared.

Customs revenue 1914-15, £61,597. Public debt (Mar. 31, 1915), £38,246. W. L. Allardyce was appointed Governor in 1914.

**BAKELITE.** See CHEMISTRY, INDUSTRIAL, *Medals*.

**BAKER, BERNARD N.** See SHIPPING BOARD, UNITED STATES.

**BAKER, NEWTON DIEHL.** An American lawyer and public official, whose appointment as Secretary of War to succeed Lindley M. Garrison was confirmed Mar. 9, 1916. Earlier in President Wilson's administration he had twice been offered the post of Secretary of the Interior. Mr. Garrison resigned because he favored a more vigorous policy of military preparedness. Mr. Baker, on the other hand, had been known as a pacifist. He had held office in Cleveland continuously for 14 years, during 10 years of that time as city solicitor and then for two terms as mayor. After the death of Mayor Tom Johnson, Mr. Baker took up the fight for various reforms, including three-cent fares in Cleveland, and carried it to success, and he gained note as a public speaker and political leader. In the Democratic National Convention of 1912, he vigorously championed Wilson's candidacy. He had first known Mr. Wilson as a teacher at Johns Hopkins when he himself was a student. For several years Mr. Baker served as private secretary to Postmaster General Wilson during Cleveland's administration, and afterward he took up the practice of law in Cleveland. At the time he entered the Cabinet, he was the youngest member of that body, being 44 years old.

**BALFOUR, ARTHUR JAMES.** A British statesman, Secretary of State for Foreign Affairs in Lloyd George's cabinet, formed in December, 1916. He succeeded Viscount (Sir Edward) Grey. See GREAT BRITAIN, *History*.

**BALKAN STATES.** See ALBANIA; BULGARIA; GREECE; MONTENEGRO; RUMANIA; SERBIA; and TURKEY; also EPIRUS; MACEDONIA; WAR OF THE NATIONS.

**BALLET, GILBERT.** A French neurologist, died Mar. 16, 1916, in Paris. Born at Ambazac in 1853 and educated at the Lycée of Limoges, he studied medicine under Charcot. His principal professional service was rendered as professor in the faculty of the Hôtel Dieu. He received many honors, having been a president of the Congress of French Neurologists and Alienists, founder of the Psychiatric Society, and officer in other organizations. He was also a Chevalier of the Legion of Honor. One of his important works was translated into English by P. C. Smith as *Neurasthenia* (1908).

**BALLET RUSSE.** See MUSIC, *Ballet*; RUSSIAN BALLET.

**BALLOONS.** See **AERONAUTICS.**

**BALLOT.** See **ELECTORAL REFORM.**

**BAMBERGER, SIMON.** Elected Democratic Governor of Utah, Nov. 7, 1916.

**BANDBOX THEATRE.** See **DRAMA.**

**BANK CLEARINGS.** See **FINANCIAL REVIEW.**

**BANKS AND BANKING.** Like its predecessor the year 1916 brought a marvelous development in the banking strength of the United States. The strain upon credit which developed after the beginning of the European war in 1914 had entirely passed by the early days of 1915; and during that year not only did American banks experience great prosperity, but under the stimulation of the Federal Reserve System there was an increased confidence and coordination in the banking business. These developments continued unabated throughout 1916. In November a list of 67 largest commercial banks of the world prepared by *The Financier* included 21 American banks, of which 14 were in New York City. In an additional list of nine government or semi-official government banks was included the United States Federal Reserve Bank as fourth largest, it being exceeded in volume of deposits by the Bank of Russia, Imperial Bank of Germany, and the Bank of England; while the only other bank comparable to it was the Bank of France. The most important developments of the year included the perfection of the Federal Reserve System and the changes in the note issues of principal foreign central banks. Material of interest in this connection will be found under **AGRICULTURAL CREDIT**, where the Federal Farm Loan banking system is described; **FINANCIAL REVIEW**; **NATIONAL BANKS**; **STATE BANKS**; and **SAVINGS BANKS**. For bank buildings, see **ARCHITECTURE**.

**FEDERAL RESERVE SYSTEM.** The second year of the Federal Reserve System, completed Nov. 16, 1916, thoroughly established it as the most important development in American banking history in several decades. Not only did it increase in strength and service to other banks, but it perfected its system of check clearances and began the establishment of foreign branches.

*Annual Report.* The Second Annual Report of the Federal Reserve Board issued February 25th included a report of the chairman of the Board of Directors of each of the 12 reserve banks and that of the Federal Reserve Board itself. It thus comprised a very comprehensive review of the country's banking conditions. It pointed out the abundance of money during 1915 with consequent low interest rates and a wide reserve of lending power throughout our banking system. These conditions, however, kept earnings of banks in general, including the reserve institutions, at a lower rate than usual. With reference to an important aspect of the business of member banks the Reserve Board held that it had no direct responsibility regarding foreign loans since it was given control only as to the commercial character of loans and not as to their destination. The report of February 25th criticized those State banks which took advantage of laws reducing their reserve requirements in order to place them on an equality with national banks, but who nevertheless refused to join the system.

The reports of the district chairmen showed that the several reserve banks had worked smoothly in cooperation with member banks.

Those at Richmond, Atlanta, and Dallas had apparently been of the greatest value to their communities, aiding members, reducing interest rates, and improving borrowing conditions for the public. It was brought out that none of the district banks had engaged in foreign operations, and that the clearings and collection system was still experimental. Nearly 75 per cent of the business done by the Federal Reserve banks in 1915 was due to open market operations, including municipal warrants, government bonds, and bankers' acceptances. Only a small percentage of the total business consisted of rediscounts for member banks, and nearly all of this was done for small country banks; thus transactions not exceeding \$5000 each constituted more than half of the total rediscount business. Another striking characteristic of the operations was that only about \$15,000,000 of reserve bank notes protected by commercial paper were outstanding at the close of the year; in other words, only a fraction of the business of these banks was done through the issue of currency, most of it being done by means of book credits or the actual payment of money on hand.

*Check Clearance and Collection System.* By section 16 of the Federal Reserve Act the Reserve Board was given authority to require each reserve bank to perform the function of check clearance for its members. Member banks, however, could not be required to avail themselves of this service. In 1915 a system of intra-district clearing was inaugurated. The plan was to have each reserve bank serve as a clearing house for its members; but experience showed that this was not workable because banks were reluctant to enter a system through which only a portion of their clearing could be balanced. Hence, on May 1st, the board issued a circular setting forth a national plan of inter-district clearings. The date of beginning operations was set for June 15th but later postponed to July 15th. Under this plan each Federal reserve bank will receive at par checks drawn on all member banks of whatever district. Checks on non-member banks will also be received at par when they can be collected by reserve banks without charge. Each reserve bank will receive from others all checks drawn on banks of its district, and will forward the same to the latter. The order established the rule that uncollected funds in a reserve bank cannot be counted as reserve either by the reserve bank or any member bank. The cost of the new system will be assessed upon member banks in proportion to business. While local banks are not compelled to utilize this service, the merits of the system are expected to lead to its universal adoption. The plan would also bring reserve banks into more intimate touch with local banking business.

*Foreign Agencies.* On December 25th the board announced that the Federal Reserve Bank of the Second (New York) District was authorized to appoint the Bank of England as its agent and correspondent in Great Britain. The authority granted provides for the appointment of agencies, and the opening of accounts with them for the purpose of buying, selling, and collecting bills of exchange. It was expected not only that similar authority would be given to other reserve banks, but also that the Bank of France would soon be brought into a similar relation. Indeed it was believed that this was merely the beginning of a general policy of establishing cor-



respondents throughout the world including not only other European institutions but banks in Japan, China, and Australia. So important had become the United States as a centre of world commerce during 1916 that dollar exchange or exchange on New York was utilized in the foreign trade of every nation. Consequently the creation of foreign correspondents of the Federal reserve system had become almost a necessity in facilitating international exchange. This system was expected also to increase American trade and to heighten the prestige of the United States in world commerce.

**Conditions.** A summary of the combined condition of 12 Federal reserve banks on Dec. 22, 1916, showed total gold reserves of \$449,917,000. This included gold held by the banks, \$269,627,000, and settlement funds balance, \$178,811,000. Other resources amounted to \$295,000,000, including bills discounted and bought of \$156,930,000, and other bonds and notes of \$84,460,000. The principal items of liabilities were: reserve deposits, \$648,787,000; government deposits, \$29,472,000; capital paid in, \$55,765,000; and Federal reserve notes, \$15,754,000. Of the loans and discounts slightly less than one-sixth matured in 10 days; nearly one-third in 30 days; nearly another one-third in 60 days, and most of the remainder in 90 days; only 0.6 per cent matured in more than 90 days. Not included in the above were Federal reserve notes in circulation amounting to \$275,046,000; these were secured by 40 per cent gold reserve. The gold reserve constituted 69.8 per cent of total liabilities.

**British Treasury Bills.** Somewhat of a sensation was occasioned late in November by a statement issued by the Reserve Board cautioning American banks not to invest too freely in a proposed issue of British Exchequer or Treasury Short-time Bills. These were promises to pay certain sums in dollars at New York at the end of 30, 60, or 90 days, 4 months, or 6 months. They were to bear, according to length of time,  $4\frac{1}{2}$  to 5 per cent interest. While in ordinary times such bills might constitute a desirable short-term investment for banks, nevertheless the board thought that under the circumstances there was much probability that the borrower would be under the necessity of extending the time of payment. Consequently the liquid character of these loans was somewhat doubtful. While the board did not wish to make any statement regarding the credit of any foreign nation, and while it recognized the advantages of such loans in steadying foreign exchange, it nevertheless thought that the absorption of these bills should be left to the general investment market. Incidentally the board expressed its opinion that continued importations of gold would not prove a source of financial danger; and with a view to increasing the control of gold movements, it suggested that the final transfer of reserves from members to reserve banks be advanced from Nov. 16, 1917, to February or March, 1917. A few days later J. P. Morgan and Company announced that the bills in question had been withdrawn from sale in deference to the board's statement.

**EARNINGS.** Statements of earnings showed that the aggregate earnings of 1915 were \$2,130,000; aggregate expenses, \$1,490,000; leaving a net income of \$640,000. For the nine months ending Sept. 30, 1916, aggregate earnings were \$3,242,000, and net earnings, \$1,528,000, or 3.7

per cent on total stock. The law required that, before any dividends be declared, all organization and current expenses be paid. The banks at Richmond (5 per cent) and at Dallas (3 per cent) were the first to declare dividends; then, late in 1916, dividends of 6 per cent were declared from earnings of the first nine months following organization by banks at Boston, Philadelphia, Cleveland, and Minneapolis, while that at New York declared 6 per cent from earnings from Nov. 2, 1914, to Mar. 31, 1915.

**PHILIPPINE NATIONAL BANK.** Early in February the Philippine Legislature enacted a law creating a national bank, with \$10,000,000 capital. The government will own a majority of the stock, 60 per cent of which was immediately payable, and the remainder in annual installments. The main purpose of the bank is to conduct financial operations previously carried on by the government itself. It is authorized to make long-term loans on real estate, and to conduct a general commercial banking and foreign exchange business. It may also issue notes based on gold and may establish branches in the provinces and in the United States. It is expected to further the development of American trade and to increase American financial control in the islands. Previously most of the banking accommodation for Philippine business had been extended by British banks and their branches. Mr. H. P. Willis, Secretary of the Federal Reserve Board, was made president and went to the Philippines on six months' leave of absence to organize the bank.

**FOREIGN BANKS.** The effect of the war on the condition of central banks abroad has been shown primarily in changes in the gold reserve and in the note circulation. These banks have been uniformly under enormous pressure to expand their circulation and consequently have been under the necessity of increasing their reserve. On Dec. 28, 1916, the Bank of England held bullion to the amount of £54,505,000, reserve £32,080,000, and notes reserve £31,577,000; its circulation was £39,696,000; public deposits, £52,151,000; other deposits, £122,403,000; current securities held, £57,188,000; and other securities, £106,459,000. The only substantial changes in these figures from Dec. 30, 1915, was an increase of nearly £11,000,000 in other deposits; and of nearly £15,000,000 in current securities.

On the same date the Bank of France held gold amounting to 5,074,913,000 francs; its circulation amounted to 16,688,798,000 francs; deposits, 2,068,210,000 francs; bills discounted, 2,042,131,000 francs; treasury deposits, 82,567,000 francs; and treasury advances, 1,307,386,000 francs. The only substantial change in these figures was an increase of 3,389,000,000 francs in note circulation and an increase of 224,000,000 francs in deposits.

The Imperial Bank of Germany on Nov. 30, 1916, held gold to the amount of \$1,967,425,000; its note circulation was \$1,783,912,000; and its current accounts, \$890,762,000. In comparison with one year previous there was an increase of \$30,244,000 in gold; an increase of \$823,186,000 in loans and discounts; an increase of \$324,554,000 in note circulation; and an increase of \$514,500,000 in current accounts.

The Bank of Russia held on Dec. 6, 1916, gold, silver, and other cash to the amount of \$1,812,115,000, or almost exactly twice the amount held one year previous. Its loans and discounts to-

taled \$3,372,734,000, an increase of \$1,165,000,000 during the year. Its note circulation was \$4,040,382,000, an increase of \$1,501,000,000 over Dec. 6, 1915. Its total deposits were \$1,124,213,000, an increase of \$485,113,000 for the year.

British banking strength never revealed greater reserve power than in successfully meeting the enormous demands of the war. By 1916 not only had the gigantic problems of handling billions of dollars of foreign exchange been worked out, but the banks had become important factors in floating government loans and extending credit to the government on Treasury short-time bills. In addition the expansion of facilities for handling foreign trade continued. The Anglo-South American Bank on August 30th opened a branch at Barcelona. The British-Italian Corporation, with \$5,000,000 capital, was formed by English and Italian banks to develop mutual trade. Plans for the British Trade Bank with \$50,000,000 were completed. The London money market during the year favored the employment by neutral bankers of much larger balances there in commercial bills than ever before, this being particularly true of American and Scandinavian bankers. It should be noted also that beginning on February 5th there were at various times consignments of bills drawn by Russian banks on English banks for the purpose of checking the decline of the ruble.

Canadian banks experienced a year of unprecedented prosperity. Their combined statement, Oct. 31, 1916, showed total assets of \$1,816,000,000, including cash reserve, \$485,000,000; liquid reserve, \$360,000,000; and loans, \$913,000,000. Liabilities included deposits of \$1,519,000,000; and circulation, \$145,000,000. Since June, 1914, deposits had increased about \$400,000,000, while commercial loans had decreased about \$150,000,000. Among the credits extended by Canadian banks was \$120,000,000 to Great Britain for the purchase of war supplies, while arrangements were nearly completed for the granting of \$45,000,000 more.

**BANTU.** See ANTHROPOLOGY.

**BAPTISTS.** According to official statements there were in the United States in 1916, 6,107,686 members of this denomination, as compared with 5,932,364 in 1915. The total number in the world in 1916 was 7,200,324, as compared with 7,003,737 in 1915. There were in the United States in 1916, 1986 Baptist associations, 51,248 churches, and 36,926 ordained ministers. The Baptists in the United States are divided into two main branches and several smaller ones. The two main branches are known as the regular Baptists, and include the Northern and Southern Baptists. The Northern Baptists had, in 1915, 1,566,356 communicants, 12,188 churches, and 12,678 ministers. The Southern Baptists had, in 1915, 4,541,330 communicants (these figures include colored Baptists in the South, of whom there are about 2,000,000), 39,060 churches, and 27,248 ministers. The larger of the smaller subdivisions are the Primitive Baptists, with about 100,000 communicants; the Free Baptists (see below); the Free Will Baptists, with about 60,000 communicants; and the General Baptists, with about 34,000 communicants. There are in addition several smaller divisions of the colored Baptists. The general work of the larger denominations is under the supervision of the Northern Baptist Convention and the Southern Baptist Convention. The meeting of the Northern Bap-

tist Convention was at Minneapolis, Minn., in May. The meeting of the Southern Baptist Convention was at Asheville, N. C., in May. The missionary work of the Northern Baptists is conducted by the American Baptist Foreign Mission Society, the American Baptist Home Mission Society, and the American Baptist Publication Society. The Southern Baptists have their own general agencies. Their foreign mission work is carried on through the Foreign Mission Board at Richmond, Va., and the home mission work through the Home Mission Board at Atlanta, Ga. The Sunday School and publication work is done through the Sunday School Board, Nashville, Tenn. For foreign missions in 1916 the Baptists of the United States contributed \$1,211,901, as compared with \$1,231,664 in 1915; for home missions, \$924,645 in 1916, as compared with \$965,698 in 1915; and for State missions in 1916 there were contributed \$993,180, as compared with \$1,059,914 in 1915. The Baptists maintain 14 theological seminaries and have under their control 101 colleges and universities. There were, in 1916, 43,597 Sunday schools, as compared with 42,769 in 1915; 335,020 officers and teachers in 1916, as compared with 325,475 in 1915; and 3,535,038 Sunday school pupils in 1916, as compared with 3,288,902 in 1915. See BAPTISTS, FREE.

**BAPTISTS, FREE.** The union between this denomination and the regular Baptist denomination is for practical purposes completed. The union of State organizations has been almost entirely accomplished in most of the States. In some cases the designation United Baptist is made. The union between the denominations was inaugurated in October, 1911, by the transfer on the part of the Free Baptists of their denominational and missionary activities to the three national mission organizations of the Northern Baptists: the American Baptist Foreign Mission Society, the American Baptist Home Mission Society, and the American Baptist Publication Society. No full statistics of the present membership of the denomination are available.

**BAR ASSOCIATION, AMERICAN.** The Association held its annual meeting in 1916 in Chicago, August 30th-September 1st. The retiring president, Elihu Root, made an address on "Public Service by the Bar." Addresses were also delivered by Lindley M. Garrison, former Secretary of War, on "Democracy and Law"; by William E. Borah, United States Senator from Idaho, on "The Lawyer and the Public"; and by Dr. Frank J. Goodnow, of Johns Hopkins University, on "Administrative Discretion and Private Rights." After an animated contest, Senator George Sutherland of Utah was elected president of the association, over Walter G. Smith. George Whitelock was reelected secretary, and Frederick E. Wadhams treasurer. In 1916 there were about 10,500 members.

**BARBADOS.** A British colony; the most easterly of the Caribbean Islands. Its area is 166 square miles, and its population (1911), 171,892 (estimated, Dec. 31, 1914, 176,397). The withdrawal of many laborers from the colony to the Canal Zone, together with emigration to Pará (Brazil) and the United States, accounts for the decrease in population since 1891, when it was 182,306. Bridgetown is the capital, with 16,648 inhabitants in 1911. The area under sugar-cane, the island's most important product, is estimated at 64,000 acres. There were in op-

eration 320 sugar works in 1914, producing 33,605 hogsheads of sugar and 101,985 puncheons of molasses. The export of cotton to Great Britain in 1914 was 220,981 pounds, valued at £13,473. In the following table, imports, exports, and shipping are for the calendar years named; revenue and expenditure for the fiscal years:

	1910-11	1911-12	1912-13	1914-15
	£	£	£	£
Imports . . . .	1,345,194	1,465,431	1,853,059	1,300,073
Exports . . . .	1,088,830	1,085,569	856,618	915,009
Revenue . . . .	218,297	234,126	214,865	228,091
Expenditure . .	211,949	230,339	222,177	236,795
Shipping * . .	3,395,085	3,346,982	3,771,598	3,528,140

\* Tonnage entered and cleared.

Customs revenue (1914-15), £111,237. Public debt (Mar. 31, 1915), £447,900 (sinking fund, £192,263). Acting Governor in 1916, W. L. C. Phillips.

**BARKAL.** See ARCHÆOLOGY.

**BARKER, ALBERT SMITH.** An American naval officer, died Jan. 30, 1916, in Washington, D. C. He was born in 1843 at Hanson, Mass., entered the Naval Academy in 1859, and two years later began service in the Civil War. On the *Mississippi*, and after its destruction in the attack on Port Hudson, on the *Monongahela*, he participated in the activities of the West Gulf Blockading Squadron, including the bombardment of Forts Jackson and St. Philip and the capture of New Orleans. Later he served on the *Lancaster* and the *Pochatan*. In 1874, while connected with the torpedo station at Newport, he was the first in the United States to fire dynamite in shells. While in command of the *Enterprise*, after 1882, he ran a line of deep-sea soundings around the world. Admiral Barker, then captain, commanded the cruiser *Newark* in 1898, being present at the bombardment of Manzanillo; then for some months he was in command of the *Oregon* and of a special service squadron to the Pacific. In 1899 he was promoted rear admiral. Between that year and 1903 he was commandant at the navy yards at Norfolk and Brooklyn, and thereafter till his retirement in 1905 served as commander in chief of the North Atlantic Fleet.

**BARLEY.** The production of barley in the northern hemisphere in 1916, as estimated by the International Institute of Agriculture, Rome, was 1,515,200,000 bushels, or 95.2 per cent of the production in 1915 and 102 per cent of the five years' average. This estimate was based to the extent of 64.2 per cent on actual estimates by different countries, and of 35.8 per cent on the average production for the five years 1909-13, regarded as the yield in 1916 for a number of countries, both belligerent and neutral, for which no other data were available. Several countries, comprising Serbia, Turkey in Europe and Asia, Mexico, China, and British India, producing as roughly estimated about 275,000,000 bushels annually, have either no statistical data at all or none for several years past, and are not included in the above estimate. For the southern hemisphere, producing according to estimates, 15,184,000 bushels in the crop year 1915-16, data for 1916-17 are not yet available.

The world's annual total consumption, including about 155,000,000 bushels required for seed, is estimated at about 1,615,000,000 bushels. With the stocks on hand from last year's crop

amounting to about 245,000,000 bushels, the production of the year more than meets the requirements.

The United States, according to estimates published by the Department of Agriculture, produced 180,927,000 bushels in 1916, as against 228,851,000 bushels in 1915, the areas devoted to the crop being 7,674,000 and 7,148,000 acres respectively. The average production for the five years 1910-14 was 186,208,000 bushels, and the average area, 7,593,000 acres. The average yield in 1916, 15.3 bushels per acre, was 2 bushels less than in 1915 and 1 bushel under the 5-year average. The mean farm value on Dec. 1, 1916, was 88.2 cents per bushel, the highest since 1868, and on this basis the total value of the crop was \$159,534,000, the highest on record. In 1915 the average farm value per bushel on December 1st was only 51.6 cents and the total value, \$118,172,000, as compared with 59.6 cents and \$110,840,000, the average values for the five years, 1910-14.

The results of feeding experiments conducted by the California Experiment Station, in which barley was fed as the sole concentrate, indicated that there was no foundation for the claim that feeding barley has an unfavorable influence on milk secretion and tends to dry up the cows. At the Tennessee Experiment Station better results in beef production were secured from a crop rotation of barley and soy beans than from rotations in which corn or oats were substituted for barley.

**BARNARD COLLEGE** (COLUMBIA UNIVERSITY). A non-sectarian institution for the education of women in New York City. Besides 699 students enrolled primarily at Barnard in the fall of 1916, there were 61 women from other schools of the university taking courses. The faculty numbered 80, but 25 additional instructors came from other departments of the university to give courses. During the year Mr Jacob H. Schiff gave \$500,000 to Barnard for a Students' Hall, to contain gymnasium, swimming pool, lunch-room, reading-rooms, etc. At the end of 1916 this building was in process of erection. The college draws \$60,000 income from its productive funds. It has a reading-room containing 1100 volumes and students have the privileges of the Columbia University (q.v.) library. President, Nicholas Murray Butler; Dean, Virginia Crocheron Gildersleeve.

**BABOTSELAND.** See RHODESIA.

**BARRIE, SIR JAMES MATTHEW.** See DRAMA.

**BARRIENTOS, MARIA.** See MUSIC, *Opera*.

**BASEBALL.** The national game had its most prosperous year in 1916. The attendance in the American League exceeded that of 1915 by more than a million, while in the older organization, the National League, all records for a period of forty years were broken. The minor leagues still suffered from the effects of the conflict between organized ball and the Federal League, but steps were taken at the meetings of the baseball rulers in December to remedy the conditions existing throughout the smaller circuits.

Two heavy clouds, either one of which may bring serious storms, loom on the baseball horizon. They are the \$900,000 suit for damages brought by the Baltimore Federal League club against organized baseball and the peace committee appointed to represent the Federals in 1915, and the threatened strike of the players.

who fear a general reduction in salaries in 1917 as a result of the withdrawal of competition due to the abandonment of the Federal League.

The Baltimore Federal League club contends that it never authorized any committee to arrange peace terms with the older leagues and therefore has recourse to legal action to recover losses sustained as the result of the peace agreement. James Gilmore, Harry F. Sinclair, Phillip Ball, Charles Weeghman, and other officials of the defunct league maintain on the other hand that they had the sanction of the Baltimore club when the baseball hatchet was buried.

The Boston American League team, known to the fans as the Red Sox, for the second year in succession carried off the championship honors. The Brooklyn Dodgers, winners of the National League pennant, were hopelessly outclassed in the series for the title, capturing only one game of the five played. The first two games were played in Boston, the second going 14 innings before the Red Sox triumphed by a score of 2 to 1. The third and fourth games were contested in Brooklyn, the Dodgers scoring their only victory in the first of these, 4 to 3.

The attendance and receipts for the big series were large considering the fact that only five games were played. A total of 143,341 persons witnessed the contests and the amount paid for admissions was \$320,361.50. The players on the winning team received \$3826.25 each and the losers, \$2645.45 each.

The pennant race in the American League was close throughout, the Red Sox finally shaking off the Chicago White Sox and the Detroit Tigers on the last trip the Boston men made through the West. The success of the Red Sox was primarily due to their wonderful pitching staff, consisting of Leonard, Ruth, Shore, and Mays. Credit also must be given to the manager of the team, William Carrigan, who went behind the bat in the crucial games and proved an inspiring and steadying influence.

The surprise of the year in the American League was the dethronement of Tyrus Cobb of the Detroit Tigers as batting king by Tristram Speaker of the Cleveland Indians. "Babe" Ruth of the Red Sox won the pitching laurels in the American League.

The National League flag chase was the most thrilling in years, the contenders being the Brooklyn Dodgers, the Philadelphia club, and the Boston Braves. The outcome was not decided until the closing week of the season. The striking feature of the season in the older league was the record-breaking spurt of the New York Giants, who captured 26 games in succession, thereby excelling the old mark of 21 straight victories set by the Providence team.

The leading batter in the National League was Hal Chase of the Cincinnati Reds, while the pitching honors again went to Alexander of the Philadelphia club.

The final standing in the National League was: Brooklyn won 94, lost 60; Philadelphia won 91, lost 62; Boston won 89, lost 63; New York won 86, lost 66; Chicago won 67, lost 86; Pittsburgh won 65, lost 89; St. Louis won 60, lost 93; Cincinnati won 60, lost 93.

The final standing in the American League was: Boston won 91, lost 63; Chicago won 89, lost 65; Detroit won 87, lost 67; New York won 80, lost 74; St. Louis won 79, lost 75; Cleveland

won 77, lost 77; Washington won 76, lost 77; Philadelphia won 36, lost 117.

The pennant winners in the more important minor leagues were: International, Buffalo; American Association, Louisville; Pacific Coast, Vernon; Western, Omaha; Southern, Nashville.

In college baseball Columbia made the best showing, going through the season with the loss of only one game. Cornell alone defeated the Blue and White nine, the score being 4 to 3. Columbia won 18 games and played a 15-inning tie with Pennsylvania. The pitching of Beck and Smith, who was signed by the New York Giants, was chiefly responsible for Columbia's fine record.

Tufts deserves second place among the college nines, winning 20 games and losing only 2. Harvard comes next with 21 victories and 3 defeats. Syracuse won 19 games and lost 3 and Lehigh won 13 and lost 5.

Harvard triumphed in the triangular series with Yale and Princeton, defeating the Tigers in two straight games and closing her season by two victories in a row over Yale. Princeton defeated Yale in two out of three games.

**BASKETBALL.** The American intercollegiate basketball championship was won by the University of Pennsylvania five with nine victories and two defeats. Princeton finished second with eight victories and three defeats. The standing of the other clubs was: Cornell won 5, lost 5; Yale won 5, lost 5; Dartmouth won 3, lost 7; Columbia won 1, lost 9. Wisconsin captured the Middle Western Conference League title, winning eleven games and losing only one. The standing of the other teams was: Northwestern won 9, lost 3; Illinois won 9, lost 3; Minnesota won 6, lost 6; Indiana won 3, lost 5; Chicago won 4, lost 8; Iowa won 2, lost 4; Ohio won 2, lost 8; Purdue won 2, lost 10.

The University of Utah won the Amateur Athletic Union championship, defeating the Illinois A. C. in the final game by a score of 28 to 27.

**BATTLE CRUISERS.** See **BATTLESHIPS AND OTHER WAR VESSELS.**

**BATTLESHIPS AND OTHER WAR VESSELS.** Their trial in war has had, of course, a tremendously stimulating effect upon the development and improvement of warships. The latest designs and the tendency of new construction in 1916 are briefly described in the following notes:

**BATTLESHIPS.** The size of battleships continued to increase. The new Japanese ships, one of which was under construction, were of 32,000 tons and they were to carry 12 15-inch guns and 20 6-inch. The speed was to be 24 knots.

The German battleships of the T class, completed in 1916, or nearly so, had a displacement of about 30,000 tons, a speed of 23.5 knots, 8 15-inch guns and 16 5.9-inch guns. A new class, two of which, it was reported, had been laid down, were to have a considerably greater displacement, a speed of 25 knots, carry 8 16-inch guns (and smaller pieces), have electric propulsion, and triple bottoms. One of the bottoms was to have 8-inch armor protection against torpedoes.

The new United States battleships were of 32,600 tons, were to have a speed of 21.5 knots, carry 8 16-inch guns (and smaller pieces), and

the heaviest armor of any ships under construction (or designed—so far as known). They were also to have armored under-water protection against torpedoes. Like their immediate predecessors, they were to be electrically driven.

The designs of the new British battleships which had been (or were shortly to be) laid down were kept secret, and the statement was made that they would possess many novel features based on the lessons of the war. One report stated that the speed would be greater than that of the *Queen Elizabeth* class (25 knots) and that they would carry 8 17-inch guns. Another report was that some of them would have comparatively low speed (20 knots), and would be specially protected against torpedoes, by means of armor and an extensive cellular structure along the sides below water. And some change in the design of turrets was expected. All rumors agreed that these vessels would be larger than any ships heretofore built for the British navy.

France was building only one new battleship. Its dimensions were not given out, but the *Moniteur de la Flotte* said it would be driven by Diesel oil engines and have a brake horse power of about 18,000. This means low speed or small size—probably both. The battery was to be carried in 4-gun turrets, and probably would consist of 8 guns of about 15 inches.

The advocates of moderate dimensions for battleships were becoming fewer. The impossibility of adequate protection against heavy guns and torpedoes without large dimensions was fully realized and if high speed was demanded it was realized that the dimensions must be still greater. Electric propulsion was growing in favor, and was not regarded with distrust even by naval authorities who were fitting their ships with geared steam turbines. The question of speed remained undecided. The United States preferred to use the extra displacement to secure better protection and greater gunpower and fuel supply. Great Britain was building both fast and slow ships, but the majority were of the slower and better protected class. The question of armor was attracting increased attention, and further deck protection over turrets, machinery, and magazines was considered necessary in view of the angle of fall of projectiles at long range. Armor against torpedo attack appeared to be fitted in all new ships and special cellular structure of some kind was also becoming a matter of course.

**BATTLE CRUISERS.** The battle cruiser was a type of war vessel that, by 1916, apparently had come to stay. The reasons were many. In the first place it had driven out the large protected cruiser and the so-called armored cruiser, and it was forcing high speed upon light cruisers and destroyers. The sinking of one German and three British vessels of this class in the battle of Jutland Bank cast much doubt on the desirability of war craft which were at once so vulnerable and so expensive. But it was not fair to condemn the type until all the facts were known. The report of the official investigation into the causes of loss might never be published—certainly not until after the war is over. But unofficial explanations were made by those who probably knew the

facts, and these stated that in the cases of the *Queen Mary* and *Indefatigable*, the turrets were pierced and the ammunition in the ready or main magazine was exploded by the deflection of the shell downwards before explosion—or in some similar way. Apparently the shells went through the *tops* of the turrets. As the range was somewhere between 14,000 and 18,000 yards the angle of fall of the projectiles was considerable and the turret top offered little resistance. Had the turret of the best-armored battleship received a similar blow a like result might have followed. The sinking of the *Invincible* was due to the fact that she was exposed to the fire of heavy German battleships and battle cruisers at short range. It was folly to place her so close to so many better protected ships and the *Inflexible* and *Indomitable*, which accompanied her, were lucky not to have shared her fate. Unless the weather was so thick that battle conditions could not be properly gauged we must conclude that Rear Admiral Hood showed more reckless courage than judgment in the course he took up. Vice Admiral Beatty evidently recognized this, for he ordered Hood to retire and prolong his column at the rear end. But before Hood could obey, his flagship was sunk, carrying him and nearly all her officers and crew to the bottom.

If the facts are as stated, the battle cruiser type must not be condemned, but certain features need correction; and vessels of this kind must not be unnecessarily subjected to a volume of fire under which a heavily armed battleship might quickly succumb.

The later battle cruisers, laid down before 1916 or thereabout to be placed under construction, were much larger than their predecessors, had higher speed, thicker armor, and more powerful guns. The details of the new British and German vessels were not given out—it was not known exactly how many were building, but they were said to be markedly better than previous ones. The details of the battle cruisers for the United States navy—of which four were to be commenced during 1917—had not been wholly settled in 1916. The speed was expected to be 35 knots, the battery eight 16-inch guns, the armor protection better than in any battle cruiser of which the details were known, and the size and engine power enormous.

**FAST LIGHT CRUISERS.** These were developments of the fast fleet scouts of 2900 tons brought out by the British navy in 1904, and exemplified by the *Salem*, *Chester*, and *Birmingham* of the United States navy. Such vessels not only could be used as scouts and commerce raiders, but as protectors of destroyer and submarine flotillas and defenders of the fleet against the destroyer and submarine flotillas of the enemy. The increase in speed of battle cruisers brought about a corresponding increase in that of light cruisers, otherwise the battle cruisers could run them down too easily and they could not fulfill their designed rôle. Before the war both Great Britain and Germany had completed light cruisers of about 5000 tons; some of the new vessels of both navies approximated 6000 tons at least, though none of this size were in service in 1916. The four American cruisers then about to be commenced were to have a displacement of 7100 tons, a speed of 35 knots, a battery of eight 6-inch guns, and carry aëroplanes (sea-

planes) and observing balloons. There was some tendency to reaction against the increase in size of craft of this type and a movement towards the development of a new class of 3000 to 3500 tons; but these must either be slower or sacrifice protection (the large vessels carry 4-inch armor belts which are proof against the guns of destroyers) as well as adequate fuel supply (which is absolutely necessary to a successful scout), because there can be very little reduction in the battery which must consist of fairly large guns. In this respect the German light cruisers, which were completed before the war, were deficient; for their guns were no larger than those of many existing destroyers.

**DESTROYERS.** For many years the destroyers of the United States navy had been much larger than those of contemporary boats in other navies. But since 1913 conditions had somewhat changed. The superior seaworthy qualities of the larger boats were recognized in all services and dimensions increased accordingly. The standard in 1916 seemed to be somewhere about 1200 tons, for the British, Japanese, Russian, Argentine, and United States navies are building most of their new boats of about this size. The French and Germans appeared to be satisfied with somewhat smaller craft, though what the Germans were building was not known. Taking a reasonable view of German naval strategy, they probably had some boats of at least 1200 tons under construction. As regards speed, this was increasing. For years it had remained around 30 knots, varying from 29 to 32. But the advancing speed of other vessels had forced up that of destroyers. Most of the new British boats were designed for 35 to 37 knots, but, according to rumor, some were expected to make more than 40 knots. The new United States boats were to have at least 35, a speed which could be given without impairing their very excellent sea-keeping qualities; and the new Japanese boats had approximately the same. The gain in speed was partly attained through the perfection of the geared turbine steam engine, an improvement which added materially to the efficiency of all propelling machinery using steam as the direct propulsive agent.

A comparatively new development in the destroyer line was the flotilla leader. Light cruisers had increased so greatly in size that some sort of flotilla flagship seemed necessary and this solution was apparently being accepted. Flotilla leaders of 1500 to 2000 tons were built or were building for Great Britain, Russia, Italy, Argentina, and Chile.

The importance of the destroyer in war operations of all sorts cannot be over-estimated. No other type of war vessel has so extended a range of duties. It is a protector of heavy ships' cruisers and submarines; it is an assailant of enemy's ships of these types; it serves as a scout, a dispatch vessel, a blockader; it can lay mines and defend mine fields; and it has saved thousands of lives from sinking vessels. See *NAVAL PROGRESS; SUBMARINES.*

**BAYONNE STRIKE.** See *STRIKES.*

**BAUXITE.** See *ALUMINUM AND BAUXITE.*

**BEAN, TABLETON HOFFMAN.** An American ichthyologist, died in Albany, N. Y., Dec. 28, 1916. He was born at Bainbridge, Pa., in 1846. He received the degree of M.D. from Columbian

(now George Washington) University in 1876 and that of M.S. from Indiana University in 1883. Dr. Bean early entered government work, first as an editor of publications, then as an assistant to the United States Fish Commission, and for 15 years (1880-95) was curator of the department of fishes in the United States National Museum. The New York Aquarium, at the Battery, was organized by him, and of it he served as director from 1895 to 1898, also filling the office of acting curator of the American Museum of Natural History in 1897. At the Chicago, Atlanta, Paris (1900), and St. Louis expositions, Dr. Bean was in charge of fishes. In 1906 he was appointed State Fish Culturist of New York State. Dr. Bean gained recognition abroad as well as in the United States. In 1908-09 he was president of the American Fisheries Society. He wrote much in his special department, collaborating with G. B. Goode in publishing *Oceanic Ichthyology* (1896), and contributing to zoological journals.

**BEAR ISLAND.** This desolate island, located between Spitzbergen and Norway, was discovered and named by Barents in 1596, and for three centuries has been considered absolutely worthless. It has suddenly become of economic importance through the discovery of extended areas of coal deposits. While the coal is not of first quality, yet its systematic mining will soon begin under a Norwegian corporation. Harbor facilities and a wireless station are already planned.

**BEATTY, SIR DAVID.** British naval officer, appointed commander-in-chief of the grand fleet in December, 1916, succeeding Sir John Jellicoe. Hero of the battle of Jutland. See *NAVAL PROGRESS, section Naval Operations; WAR OF THE NATIONS.*

**BEAUX-ARTS INSTITUTE OF DESIGN.** An organization incorporated in 1916 to carry on educational work previously conducted by the Society of Beaux-Arts Architects. With the Society it is housed in a building of its own at 126 East Seventh-fifth Street, New York City. The season of 1915-16 was the twenty-third in which a course of instruction had been offered. Ateliers, 112 in number, were maintained in 89 cities—36 States, besides Canada and Panama, being represented. There were 846 registered students who submitted 2457 drawings. Exclusive of prize competition there were 42 other competitions. The following prizes were awarded during the year: Pupin; Warren; Morris Loeb (two competitions); Spiering; Municipal Art Society; and American Group of the Société des Architectes Diplomes par le Gouvernement Français (prize and medal). The object of the Institute and the Society is to perpetuate the principles and associations of the Ecole des Beaux-Arts, Paris.

**BECK, EDWARD ANTHONY.** An English educator, died at Cambridge April 12, 1916. Born in 1848 at Castle Rising, Norfolk, he attended Bishop Stortford Grammar School and Trinity Hall, Cambridge, where he received numerous honors, graduating in 1871. With his college he was identified throughout his life, as tutor, proctor, and, after 1902, as master, and he was known and greatly beloved by all Trinity Hall men. For eight years he served as a member of the Council of the Senate of the University, and from 1904 to 1906 as vice chancellor. His

literary ability, particularly in the form of light verse, was well known to his own circle.

**BEECHAM, SIR THOMAS.** See **MUSIC, England.**

**BEECKMAN, ROBERT LIVINGSTON.** Re-elected Republican Governor of Rhode Island, Nov. 7, 1916. See **RHODE ISLAND.**

**BEER.** See **LIQUORS.**

**BEEF SUGAR.** See **SUGAR.**

**BEGAS, KARL.** A German sculptor, died Feb. 22, 1916. He was born in Berlin in 1845, and belonged to a famous family of sculptors. He studied in the studio of his brother Reinhold in Berlin, and also in Italy. In Berlin he executed important commissions, especially of monumental portrait statues, although he is known also for smaller figure groups. His statue of Knobelsdorff is in the Berlin Museum, and statues of Solon and Aristotle are at the University of Kiel. Other works include: the Franco-Prussian War monument at Cassel, an equestrian statue of William II at Barmen, and a monument to Empress Auguste Victoria at Urville, Elsass.

**BELGIAN CONGO.** See **CONGO, BELGIAN.**

**BELGIAN RELIEF COMMISSION.** See **RELIEF FOR WAR VICTIMS.**

**BELGIUM.** One of the smaller European states, lying between France and the Netherlands and bordering on the North Sea; a constitutional monarchy, hereditary in the male line of the house of Saxe-Coburg-and-Gotha. Capital, Brussels. During the present great European war the government was removed first to Ostend, later to Le Havre, France. The Germans occupied Brussels Aug. 20, 1914; Antwerp, Oct. 9, 1914; Ostend, Oct. 15, 1914. The German government levied a war tax amounting to 480,000,000 francs in the year ending October, 1916; took over administrative powers, seized public utilities, and deported large numbers of the civil population to work in German mines and factories.

**AREA AND POPULATION.** The area and population by provinces, according to the census taken Dec. 31, 1910, and compared with the population as estimated Dec. 31, 1912, with the number of inhabitants (density) per square kilometer in 1910, are as follows:

	Sq. km.	1910	D.	1912
Antwerp	2,882	968,677	348	1,004,909
Brabant	3,283	1,469,677	455	1,522,941
West Flanders	3,284	874,135	272	884,777
East Flanders	3,000	1,120,385	375	1,134,079
Hainaut	3,722	1,232,867	333	1,247,042
Liège	2,895	888,341	308	896,649
Limburg	2,408	275,691	116	284,171
Luxemburg	4,418	231,215	52	232,500
Namur	3,660	362,846	99	364,319
<b>Total Belgium</b>	<b>29,451*</b>	<b>7,423,784†</b>	<b>254</b>	<b>7,571,387</b>

\* 11,371 square miles. † *De jure* population; *de facto* population, 7,416,454.

Belgians in 1910 numbered 7,175,222; French, 80,705; Dutch, 70,950; Germans, 57,010; Luxembourgais, 10,367; Russians, 7491; English, 6974; Austro-Hungarians, 5927; Italians, 4490; other Europeans, 1514; non-Europeans, 3074. Of the total population in 1910, 3,680,790 were males and 3,742,994 were females. The census of 1900 returned 6,693,548 (3,324,834 males and 3,368,714 females); 1880, 5,520,009; 1850, 4,426,205.

The population of Antwerp as calculated

Dec. 31, 1912, was 312,844 (with suburbs, 412,917); Brussels, 175,809 (756,637); Liège, 170,634 (235,584); Ghent, 167,477 (211,519); Schaerbeek,\* 90,231; Ixelles,\* 81,772; Molenbeek-St.-Jean,\* 76,248; St.-Gilles,\* 66,572; Anderlecht,\* 68,315; Malines, 59,735; Bruges, 53,635; Borgerhout, 51,486; Verviers, 45,964; Ostend, 43,002; Louvain, 42,482; Seraing, 41,833; Tournai, 37,349; Courtrai, 36,029; Laeken,\* 37,060; Alost, 35,603; St.-Nicolas, 35,128; Etterbeek,\* 34,557; Namur, 32,453; St.-Josse-ten-Noode,\* 32,474; Berchem, 31,655; Charleroi, 29,462; Uccle, 29,282; Jumet, 28,082; Mons, 27,805; Lierre, 26,162; Forest, 27,346; Roulers, 26,027. The asterisks mark faubourgs of Brussels.

The number of marriages in 1912 was 61,278; births, 171,187; deaths, 112,378; stillbirths, 7789; immigrants, 42,980; emigrants, 35,775. No later returns are available.

**EDUCATION.** Schools are maintained by communal taxation, with provincial and state grants, while many are under ecclesiastical control (largely Roman Catholic). There are numerous private and special schools, besides universities (state) at Ghent and Liège and (non-state) at Louvain and Brussels.

**AGRICULTURE.** The Meuse and its tributary, the Sambre, divide the country into two distinct regions, the western part being for the most part level and fertile, the eastern (the tableland of Ardennes) possessing a poor soil. The type of agriculture practiced is highly intensive. It was calculated that before the German invasion there were under cultivation in the kingdom 2,607,514 hectares (including 721,938 fallow, underbrush, and otherwise irregularly productive), of which 1,818,156 under sown crops and grasses, and 67,419 under orchards, gardens, vineyards, etc. No later figures are available than those given in the preceding **YEAR BOOK.**

The agricultural population has steadily declined from 24.98 per cent in 1864 to 21.77 per cent in 1880, and 18.79 in 1895.

**MINING AND METALS, ETC.** Belgium is essentially a manufacturing country and she is largely dependent on her neighbors for food. The abundance of cheap fuel makes practicable an extensive metallurgical industry, for which ores are imported, the output from the domestic metallic mines having materially decreased since 1880. No later official figures than those given in the preceding **YEAR BOOK** are available at present.

**COMMERCE.** The table below gives (in millions of francs) the trade, general and special, for comparative years:

	1890	1900	1910	1911
Imports, general	3,189.2	3,594.4	6,551.7	6,806.4
Imports, special	1,672.1	2,215.8	4,265.0	4,508.5
Exports, general	2,948.1	3,297.5	5,694.6	5,879.3
Exports, special	1,437.0	1,922.9	3,407.4	3,580.3

In 1912 the imports for consumption were valued at 4,958,000,000 francs; the exports of domestic produce, at 3,951,500,000; transit, 2,437,300,000. In the table below are shown important articles of import, with values for comparative years, in francs:

Imports	1912	1913
Wool	428,629,000	410,190,000
Wheat	401,903,000	393,186,000

Imports	1912	1913
Cotton	211,927,000	210,420,000
Lead	291,495,000	29,067,000
Raw hides	179,818,000	189,156,000
Coal	148,409,000	161,957,000
Corn	189,047,000	110,425,000
Rubber	184,654,000	145,235,000
Flax	108,920,000	100,673,000
Beer	11,422,000	18,078,000
Barley, etc.	91,733,000	78,018,000
Coffee	86,663,000	92,830,000
Seeds	145,656,000	172,725,000
Wood	123,074,000	124,505,000
Jute	17,617,000	14,673,000
Pig iron	58,449,000	43,323,000
Machinery	97,595,000	107,036,000
Oil cake	53,318,000	56,309,000
Copper	47,902,000	42,082,000
Chem. prod.	120,568,000	141,696,000
Petroleum	45,008,000	42,108,000
Dyes	57,200,000	65,289,000
Wine	35,915,000	40,842,000

A table of exports for comparative years follows, values in francs:

Exports	1912	1913
Wool	396,001,000	350,497,000
Flax	140,875,000	132,823,000
Flax yarns	131,018,000	114,402,000
Zinc	120,017,000	93,499,000
Raw hides	119,732,000	112,384,000
Vehicles	119,821,000	94,884,000
Rubber	109,945,000	109,249,000
Iron and steel	262,149,000	251,315,000
Wheat	93,612,000	73,126,000
Coal	92,309,000	90,230,000
Cotton	92,882,000	84,348,000
Vegetable oil	48,512,000	31,208,000
Copper	29,819,000	32,771,000
Machinery	94,250,000	77,112,000
Oil cloth	2,441,000	2,854,000
Window glass	48,224,000	45,741,000
Dyes and colors	62,249,000	68,127,000
Corn	44,071,000	24,380,000
Lead	32,191,000	34,712,000
Horses	37,831,000	40,894,000
Wool yarns	61,868,000	65,092,000
Chemical products	83,285,000	93,601,000
Paper	88,687,000	37,388,000

**RAILWAYS.** At the end of 1912 there were 4719 kilometers of railway in operation, of which 4369 were operated by the state. Local lines, 3855 kilometers. The Belgian railway lines, as a result of the German invasion, came into the possession of the German authorities and were operated by them regularly after November, 1914.

**FINANCE.** The monetary unit is the franc. The table of revenue and expenditure below is in thousands of francs and includes loans (1912 budget):

	1900	1909	1912	1913
Rev. ordinary	494,106	645,107	754,263	757,655
Rev. extraordinary	48,672	150,109	22,254	.....
Total	542,778	795,216	776,517	.....
	1900	1909	1912	1913
Exp. ordinary	479,056	634,450	753,278	755,540
Exp. extraordinary	95,102	151,747	146,518	.....
Total	574,158	786,197	899,796	.....

Details of the 1914 budget were as follows, in thousands of francs: Revenue—property taxes, 30,362; personal taxes, 27,257; trade licenses, 9500; tax on incomes, 18,000; motor cars, 1500; cinemas, 500; mines, 29; customs, 72,031; excise, 94,703; various, 1652; registration, etc., 49,100; succession, 32,100; stamps, 14,500; fines, etc., 3013; rivers, etc., 3690; railways, 362,300; telegraph and telephone, 23,535; post offices, 27,950; steamboats, 2210; domains, etc., 5590; various, 28,179; repayments, 9609;—total, 807,313. Expenditure—

public debt, 217,503; civil list, dotations, 5614; justice, 32,248; foreign affairs, 5127; interior, 7979; sciences and arts, 43,179; industry, 26,873; railways, 246,484; marine, posts, telegraphs, 54,693; war and gendarmerie, 101,096; finance, 26,544; public works and agriculture, 35,139; colonies, 1443; repayments, etc., 2826; total, 806,754.

The debt stood Jan. 1, 1913, at 3,739,133,738 francs—219,959,832 francs share of the Netherlands debt at 2½ per cent and 3,519,174,106 francs loans at 3 per cent. The greater part of the debt was raised for public works, and the interest is more than covered by the revenue from railways alone.

The estimated revenue of the German governor-general for 1916 was 248,649,935 francs, and the expenditure 274,480,435—a deficit of 25,830,500 francs.

**ARMY.** The reorganized Belgian army remained in 1916 occupying its allotted portion of the defenses of the western frontier. This portion differed from the other fronts in that the Belgians had flooded the intervening hostile ground by means of the Yser and the Yser canal so that except for artillery fire they were not often in actual contact with the Germans. By 1916 the Belgian army had been not only reorganized but reequipped and outfitted through the efforts of the Allies and through such munition or other works that were operated either in France or in the small part of Belgian territory still unoccupied. As the condition demanded for the most part artillery positions and defenses these were provided and the Belgian army was reported to have the most formidable artillery strength of any army of its size. All types of heavy guns were supplied by the Allies, while guns abandoned by the Germans when overtaken by the flood were recovered and repaired. The cavalry was being drilled for the most part in France and was becoming much improved and ready for the opportunity that might come later. The infantry was concerned with the water defenses, manning the dykes that form the first line defenses. Much of the Belgian motor equipment and especially the motor batteries used so effectively was transferred to the Allies.

**GOVERNMENT.** In 1830 Belgium separated from Holland, and her neutrality was guaranteed by a conference of the European powers; and by a further treaty, signed in 1839, by Austria, France, Great Britain, Prussia, The Netherlands, and Russia.

The Belgian constitution of 1831 vests the legislative power jointly in the King, the Senate, and the Chamber of Representatives. The reigning King, Albert (born April 8, 1875, son of the late Prince Philip of Saxe-Coburg-and-Gotha and of Flanders), succeeded Leopold II (his uncle), Dec. 17, 1909. He married (Oct. 2, 1900) Elizabeth of Bavaria. Heir-apparent, Prince Leopold, born Nov. 3, 1901.

HISTORY

**GERMAN FINANCIAL CONTROL.** There were conflicting reports during the year as to the German financial administration. It was asserted on the authority of Belgian sources on September 11th, that the German officials had seized funds to the amount of \$150,000,000, which had been deposited in the Belgian Na-



tional Bank, after the suspension of the moratorium, and that the Germans had announced their intention of keeping the money until two years after the end of the war, and of paying 5 per cent interest. This was denied by German authorities, which declared that after negotiations with the Belgian National Bank the German Imperial Bank notes were transferred to the Imperial Bank and credited to the Belgian institutions, the latter having agreed to this arrangement. The Belgians maintained that the German authorities had arrested and deported without trial M. Carlier, manager of the Belgian National Bank. The German authorities denied that the arrest of M. Carlier had anything to do with the financial transactions. On September 17th, the German government gave notice to foreign powers that any loan to Belgium was null and void so long as the country was occupied by the German military.

**FLEMISH MOVEMENT.** There was much discussion of the nationalistic movement of the Flemings during the year, and considerable speculation as to what extent it was fostered by German influence. In the summer the Flemish People's party renewed its activities, and published a platform calling for the division of the country into two states, one Flemish and the other Walloon, which would be united under the Federal government. At a meeting afterwards a constitution was outlined, providing for self-government on the part of each state, and for the Federal control of only the following departments: Foreign policy, currency, customs, finance, railways, posts, telegraphs, telephones, and the army and navy. Flemish was to be the official language of the Flemish part, and French of the Walloon.

**FORCED LABOR AND DEPORTATIONS.** On Aug. 15, 1915, the German Governor-General in Belgium issued a decree ordering forced labor for the unemployed under pain of imprisonment and fine. On May 2nd, another decree was issued, authorizing the German officials to provide work for the unemployed and rendering any unauthorized person who gave them work liable to three years' imprisonment and a fine. This was followed by a third decree on May 13th, authorizing the civil and military officials to take forcible measures for bringing the unemployed to their places of work. All these measures were defended by the Germans on the ground that the unemployed were a menace to public order, and a burden on public charity. These points were denied by the Belgians. The German Governor-General further defended these measures for the reason that widespread unemployment burdens the finances and its prolongation causes the workmen to lose their technical skill. He also said England was to blame, since she had ruthlessly cut off Belgium from war materials, with a view to placing her under British economic domination after the war. Cardinal Mercier, summing up these points in a protest addressed to the civilized world on November 7th, urged that the best way to protect Belgian finances was to put an end to the war levies, which he said had reached the total of 1,000,000,000 francs, and also to the requisitions in kind which had amounted to several thousands of millions of francs. He declared that to these hardships was now added the deportation of Belgian laborers. He alleged that 400,000 work-

men, reduced to unemployment as a result of the invasion, were subjected to forcible separation from their families, herded into cars, and carried to distant places where they were obliged to work under the German authorities, thus releasing German workmen for military service. It was reported in American newspapers that Belgians, who for any reason were not engaged in work, were gathered by the German authorities into workshops, and obliged to sign contracts printed in German, requiring them to work in Germany for eight cents a day, that they were then shipped to various points in the occupied territory, and that no provision was made for the support of their families. In response to Cardinal Mercier's appeal of November 7th in regard to the Belgian deportations the archbishops and bishops at the session of the Catholic Institute at Paris published an address expressing their sympathy and condemning the deportations as a reestablishment of slavery, inhuman, criminal, and violative of all laws, human and divine. Reports received toward the end of the year indicated that in spite of the fact that the deported Belgians were offered better food and better treatment in general if they would do the work assigned to them, a great many of them persisted in refusing in spite of the most severe hardships. Some of these, after having held out under this discipline for many days, were sent back to their homes in a very enfeebled condition and bearing evidences of tuberculous infection. The United States State Department decided to make the matter the subject of an informal diplomatic remonstrance at Berlin. See UNITED STATES, paragraphs on *History*. See also SPAIN, *History*. **BELGIUM, COMMISSION FOR RELIEF IN.** See RELIEF FOR WAR VICTIMS.

**BENEDICT XV, POPE.** See ROMAN CATHOLIC CHURCH; WAR OF THE NATIONS, *The Diplomacy of the War*.

**BENEFACCTIONS.** See GIFTS AND BEQUESTS.

**BENNETT, ARNOLD.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*.

**BEREA COLLEGE.** A coeducational institution at Berea, Ky., founded in 1845. In its five departments it had 1350 students enrolled in 1916. The faculty numbered 101. During the year two new buildings were erected and \$500,000 was added to the endowment, which totals \$1,500,000. The library possesses 32,000 volumes. President, William Goodell Frost.

**BERGSON, HENRI.** See PHILOSOPHY.

**BERIBERI.** See VITAMINS.

**BERMUDA.** A British colony, composed of about 300 small islands lying some 500 miles east of Cape Hatteras. Area, about 19 square miles; population (1911 census), 18,994 (12,303 colored). Hamilton (the capital) had 2627 inhabitants; St. George's, 1079. Nearly three-fourths of the area is unfit for cultivation. The remainder is utilized for the production of early spring table crops, for export to the United States. There are no railways. Commerce and finance statistics are given below for comparative years:

	1911	1912	1913	1914
Imports . . . . .	£545,540	£637,178	£570,575	£565,611
Expenditure . . . . .	90,100	78,210	87,779	108,661
Exports . . . . .	184,033	116,586	90,695	80,505
Revenue . . . . .	79,248	83,629	80,576	89,575
Shipping * . . . . .	700,869	1,278,666	1,255,866	1,211,002

\* Tonnage entered and cleared.

Customs revenue (1914), £80,504. A governor administers the colony.

**BERNHARDT, SARAH.** See DRAMA.

**BETHMANN-HOLLWEG, THEOBALD VON.** See GERMANY, *History*; WAR OF THE NATIONS.

**BETTONA.** See ARCHÆOLOGY.

**BIBLE SOCIETY, AMERICAN.** The American Bible Society celebrated its centennial in 1916. Besides the commemorative exercises held by synods and conferences and in churches, seminaries, etc., public celebrations were arranged in Washington and some 14 other great centres of the United States, and in the following foreign capitals: Buenos Aires, Tokyo, Peking, Bangkok, and Cairo; also in Honolulu, Yokohama, and Seoul. Among the prominent speakers at these celebrations were President Wilson, Vice-President Marshall, Speaker Champ Clark, Joseph H. Choate, William J. Bryan, a number of bishops of the Methodist Episcopal Church, and noted educators. It was reported that in the 100 years of its existence the Society had issued 71,536,305 Scriptures at home and 46,151,286 abroad, the corresponding figures for 1916 being 2,707,971 and 5,053,406. During the century it has printed the Bible at the New York Bible House in 54 languages; has aided the translation or revision of the Scriptures in more than 80 languages; and through translation or circulation has provided the Scriptures in 150 of the over 500 languages in which they are available. The Society has an endowment that yields about \$85,000 annually, but its annual expenditure is from \$600,000 to \$800,000. The president in 1916 was James Wood of New York, the corresponding secretaries Drs. John Fox and William Ingraham Haven, the recording secretary Dr. Henry Otis Dwight, and the treasurer William Foulke. Dr. Dwight has published a *Centennial History of the American Bible Society*.

**BICKETT, THOMAS W.** Elected Democratic Governor of North Carolina, Nov. 7, 1916.

**BICYCLING.** See CYCLING.

**BIDDLE, JOHN.** An American army officer, appointed superintendent of the United States Military Academy at West Point, May 17, 1916. He took office on July 1st of the same year, succeeding Colonel Clarence P. Townsley. He was born in Detroit in 1859, and upon graduating from West Point in 1881 was appointed to the Engineer Corps, with which he remained identified. By 1892 he had risen to the rank of captain, and by 1911 to that of colonel, gaining a reputation for high ability. During the Spanish-American War, as chief engineer of United States Volunteers, he served in the expedition to Porto Rico and in Cuba, and for two years he was on duty in the Philippines. At various times Colonel Biddle had charge of river and harbor work at Nashville, Tenn., at San Francisco, and at Baltimore, and from 1901 to 1907, while engineer commissioner of the District of Columbia, he did much for the development of Washington. For several years he was attached to the General Staff at the War Department. During the first half of 1915 he was an observer with the Austro-Hungarian army in Austria and Poland, and subsequently he had charge of river and harbor work at Baltimore.

**BILLIARDS AND POOL.** The outstanding feature of the year 1916 in billiards was the remarkable interest shown in the game by amateurs. Francis S. Appleby, a student of Colum-

bia University, won the National Class B 18.2 balk line championship and also distinguished himself in the Class A tournament in which the victor was Edward W. Gardner, the veteran player. Edgar T. Appleby, a brother of Francis, and Julian Rice were two other amateurs to display unusual skill at the game during the year.

William H. Hoppe again reigned supreme at all forms of balk line billiards, easily outclassing his rivals in the various matches played in New York, Chicago, and other cities. In the three-cushion play Alfred De Oro was forced to bow to the superior prowess of George Moore. The championship laurels in pool, or pocket billiards, went to Frank Taberski of Schenectady, N. Y.

**BIOGRAPHY.** See GERMAN LITERATURE; LITERATURE, ENGLISH AND AMERICAN; RUSSIAN LITERATURE.

**BIOLOGY.** See BOTANY; ZOOLOGY.

**BIPLANES.** See AERONAUTICS.

**BIRDS.** See ORNITHOLOGY; ZOOLOGY, *Aves*.

**BIRTH CONTROL.** See NATIONAL BIRTH CONTROL.

**BIRTH RATE.** See VITAL STATISTICS.

**BLACKLEG.** See VETERINARY MEDICINE.

**BLACKLIST.** See FINANCIAL REVIEW.

**BLACK TOM EXPLOSION.** See FIRE PROTECTION.

**BLAKE, LUCIEN IRA.** An American electrical engineer, died May 4, 1916. He was born at Mansfield, Mass., graduated at Amherst in 1877 (A.M., 1880), and later took his Ph.D. at the University of Berlin (1883). From 1884 to 1887 he served as professor of physics and electrical engineering at Rose Polytechnic Institute; for 19 years held a similar chair at the University of Kansas; and in 1906 became connected with the Submarine Signal Company of Boston, of which he was chief engineer for a year, and thereafter consulting engineer. In 1893-94, also, he held the post of constructing electrical engineer to the United States Lighthouse Board. Mr. Blake invented a telegraph apparatus for use by submarines.

**BLASCO IBANEZ, VICENTE.** See SPANISH LITERATURE, *Novel*.

**BLIMPS.** See AERONAUTICS.

**BLISS, DANIEL.** An American missionary and educator, died in Beirut, Syria, July 18, 1916. He was born at Georgia, Vt., in 1823, graduated from Amherst in 1852, and in 1855 took the degree of A.M. from the same college. In 1855, also, he finished the course at Andover Theological Seminary and was ordained to the Congregational ministry. For six years he labored as a missionary at Mt. Lebanon, Syria, returning to the United States at the end of that period. This was in 1862, during the Civil War, but Dr. Bliss was successful, nevertheless, in raising \$100,000 to found an American Protestant college in Beirut. In England he raised \$20,000. The college was opened in small quarters with 16 pupils, but in 1873 a new building was dedicated, and eventually this became only one of many. In 1902, when he retired, to be succeeded by his son, Howard S. Bliss, the institution had long been known as one of the two most important of the kind in the Near East, the other being Robert College, Constantinople. It then had more than 800 students and some 75 teachers. Amherst College gave Dr. Bliss the degree of D.D. in 1864.

**BLOW, SUSAN ELIZABETH.** An American educator, died in New York City, March 26, 1916. She was known as the "mother of the kindergarten," as developed in the public schools of the United States. Miss Blow was born in St. Louis in 1843. In 1873, after spending some time in Germany where she studied the kindergartens organized after Froebel's ideas, she gained the permission of the board of education of St. Louis to use a room in one of the St. Louis schools for a kindergarten. For a year she carried this on at her own expense. Her success was so great that the next year others were opened, and also, under Miss Blow's direction, a training school for kindergarten teachers. In 1886, because of poor health, she gave up her activities in St. Louis, but at once began to write, her first book being *Symbolic Education* (1894). She lectured in Boston and in many other cities, from 1909 to 1912 she delivered an important course at Teachers College, New York, and for some years before her death she was connected with the graduate department of the New York Kindergarten Association. Besides the book named, she published *Letters to a Mother on the Philosophy of Froebel* (1899), and *Educational Issues in the Kindergarten* (1908).

**BOCHE.** A colloquial term long employed in France to designate a German, but which became very familiar after the outbreak of the war. Several derivations have been suggested. According to one view it is an abbreviation of the word *caboche*, which is a slang term for head.

**BOGGIANI, THOMAS PIUS, CARDINAL.** See ROMAN CATHOLIC CHURCH.

**BOGUE, VIRGIL GAY.** An American civil engineer, died at sea, Oct. 14, 1916, when returning from Mexico. He was born at Norfolk, N. Y., in 1846, and after graduating in 1868 from Rensselaer Polytechnic Institute was for a year assistant engineer of Prospect Park, Brooklyn. During the next eight years he became widely known for his work as assistant engineer of the Oroya Railway and its Cerro de Pasco branch in Peru. The road had to be built across the Andes at a height of 15,645 feet. Mr. Bogue remained in Peru until 1880, when he returned to the United States as engineer of the construction work of the Northern Pacific Railway. The next year he discovered Stampede Pass, and drove a two mile tunnel that became famous. After six years, he went over to the Union Pacific, and was its chief engineer until 1891. Thereafter he was engaged in private practice, as a consulting engineer, with offices in New York. To the department of public works of that city he served as consulting engineer. Mr. Bogue was greatly in demand as an expert in matters of railway routes, economics, etc., especially for the Southern Pacific, the Tehuantepec National Railway of Mexico, the Denver, Western, and Pacific, the Canadian Pacific, and the railways of New Zealand. He was called upon to plan the tidelands and waterfront improvement of Seattle, Wash., and to advise on navigation of the Columbia River. He was a member of numerous engineering societies.

**BOHEMIA.** A crownland and titular kingdom of Austria. See AUSTRIA-HUNGARY.

**BOILERS.** The tendency towards increased size of boiler units that had been manifested in previous years continued in 1916, and where once the average upper limit for large plants had been 6000 to 7000 square feet of heating

surface, it had become 12,000 square feet, while at the Connors Creek plant of the Detroit Edison Company and at Delray practically double this amount of heating surface was employed. Particularly large boilers of the Badenhausen type were being installed at the new plant under construction for the Ford Motor Company at Detroit with 25,000 square feet of heating surface. These boilers were the largest in the United States and naturally were compared with the Siller-Christians boiler at the Reisholz Station of the Rheinisch-Westfälisches Electricitätswerk A. G. near Düsseldorf, Germany, as this was stated to be the largest unit in Europe, having 29,600 square feet of heating surface in the boiler proper. It was able to evaporate from 123,000 to 132,000 pounds of feed water per hour from 86° Fahrenheit into steam at 220 pounds gauge pressure and 600° Fahrenheit temperature. In the United States, however, the limits of capacity apparently were not reached, for one manufacturer was reported as ready to supply boilers with as much as 40,000 square feet of heating surface in the seven-drum design built for 300 pounds pressure, while designs for boilers with 45,000 square feet of heating surface were said to have been prepared by the builders of the new Ford units.

In the design and operation of boilers there was a tendency towards higher pressures and increased efficiency was being secured by the use of recording instruments and especially steam and water meters. The economizer continued to grow in favor and in the larger installations it was often built in as an integral part of the boiler. Improved automatic stokers were being developed, one of which, a forced-draft chain gate stoker, was attracting interest.

A new form of boiler intended for marine use was the Talbot boiler of the contra-flow type with forced circulation and intended for high operating pressures. The water enters near the stack and after being driven through the tubes at high velocity, which favors a high rate of evaporation, leaves the boiler near the furnace in the form of steam. The boiler has no drums and consists of tubes and headers of relatively small diameters so it possesses unusual strength. The feed water and fuel burners are controlled automatically.

The Boiler Code of the American Society of Mechanical Engineers, dealing with boiler construction (see YEAR BOOK for 1915), continued to attract attention and was being advocated by manufacturers, insurance interests, and especially the American Uniform Boiler Law Society. During 1916 this code was adopted by Pennsylvania and California and other States and some important cities were considering the matter favorably. There was a manifest need of boiler rules and the code seemed the best and most useful statement available for legislation. Boiler inspection and engineers' license laws were discussed in a number of States though there was little legislation enacted. A bill introduced in Rhode Island failed of passage, while in many States there were no sessions of the legislatures at which bills could be introduced. In Washington, Wisconsin, Maryland, and Colorado the subject was actively agitated, and in Louisiana a bill was enacted authorizing the appointment by the Governor of a commission of five experts to examine the code and report on whether it should be enacted into law.

Specifications for boiler work for the Panama Canal specified that construction should be in accordance with the code with alternate bids on boilers not so constructed. It was stated that New York might adopt the new code for future work, though modifications might be required in the sections referring to existing installations. The matter was in charge of a committee of the Industrial Commission of the State of New York.

The technical journal *Power*, which tabulates boiler failures in the United States, reported for the year ended June 30, 1916, 333 such accidents with 147 fatalities and injuries to 377. The property damage represented near \$500,000, or about \$1500 per accident. The assigned causes for the failures were as follows: cast-iron headers, 60; ruptured tubes, 39; low water, 36; high pressure, 16; and cast-iron water and steam heaters, 90.

See STEAM ENGINES.

**BOISSEVAIN, INEZ MILHOLLAND.** An American woman suffrage leader and lawyer, died Nov. 25, 1916, at Los Angeles, Cal., where she had been overtaken by illness during a speaking tour made in behalf of the Woman's party. Inez Milholland, as she was known in suffrage circles even after her marriage to Eugene Boissevain, a Dutch electrical engineer, was the daughter of John E. Milholland of New York and was born in 1886. At Vassar College, from which she graduated in 1909, she was prominent in athletics and for her championship of radical social ideas. Part of her time was devoted to court probation work in Poughkeepsie. During a vacation she went to England, joined Mrs. Pankhurst's forces, and was arrested in a demonstration. Admittance to Oxford, Cambridge, and the Harvard Law School having been refused her on account of her sex, she entered the Law School of New York University in 1912. In that year Miss Milholland, besides continuing to work for suffrage, aided the shirt-waist strikers in New York. Her methods were somewhat spectacular, but her enthusiasm and ability as a speaker and organizer made her invaluable to the Woman's party and the Congressional Union, with which she was identified. Her marriage to Mr. Boissevain took place in London, July 15, 1913.

**BOKHARA.** A Russian vassal state in central Asia. Estimated area, 83,000 square miles; estimated population, 1,500,000. Capital, Bokhara, with about 75,000 inhabitants. The town of Bokhara is only a few miles from the line of the Trans-Caspian Railway, which traverses the country; the length of the railway within Bokhara is 186 miles.

**BOLDT, GEORGE CHARLES.** An American hotel proprietor, died Dec. 5, 1916, in New York at the Waldorf-Astoria Hotel, of which he had been head since 1893. He was born in 1851 of German peasant parents on the island of Rügen in the Baltic Sea. He had a good elementary education. At 13 he came to the United States to try his fortunes. His first real opportunity came to him as steward of Parker's restaurant. Afterward, in a similar position at the Clover Club, Philadelphia, he gained the confidence of wealthy men, who were ready to back him when he wanted to start the Bellevue Hotel. This was the first hotel in the country to charge very high rates and give extraordinary service. Success came of the venture. An acquaintance with

William Waldorf Astor led in 1893 to the building of the Waldorf Hotel in New York, which at the time was unsurpassed in elegance. It also was a great success, although first called "Boldt's Folly." Foreign hotel men came to America to inspect the Waldorf plant and learn the Boldt methods. In 1897 ground was broken for the Astoria Hotel, which was joined to the Waldorf. At the time of Mr. Boldt's death a ten-year lease on this property at \$800,000 a year had just been renewed. In Philadelphia he was instrumental in the building of the new Bellevue-Stratford and became its proprietor. He had interests in various banks and corporations and was an enthusiastic supporter of Cornell University, of which he was acting president of the Board of Trustees, and to which he had given \$100,000. Mr. Boldt owned a famous thousand-acre estate on the St. Lawrence River. His fortune was supposed to be about \$25,000,000. Many of the notable men of the country counted themselves his friends.

**BOLIVIA.** An interior republic of South America. The executive and legislative departments of government are at La Paz, the largest city, where also the members of the diplomatic corps are resident; the Supreme Court sits at Sucre, the old capital.

**AREA AND POPULATION.** For both the extent of the country and the number of inhabitants varying estimates are current. A recent official estimate places the area at 1,379,014 square kilometers (532,437 square miles) or, including disputed territory, 1,458,034 square kilometers (562,047 square miles). Another estimate, which is perhaps as nearly satisfactory as any until the Paraguayan boundary is determined, is 514,690 square miles. The often quoted estimate of 708,195 square miles may be regarded as much too large. The 1900 census returned a population of 1,744,568, of whom 50.9 per cent were Indian, 26.7 per cent mestizo, 12.7 per cent white, 0.21 per cent negro, and 9.4 per cent unclassified. A calculation published in 1915 showed a population of 2,492,377; it is not unlikely that the figure used in a publication of the Pan American Union in 1916, namely, 2,267,935, is more nearly correct. The great lofty plateau of Western and Central Bolivia contains the larger part of the population, both rural and urban. Estimated population of the larger towns: La Paz, about 95,000; Cochabamba, about 30,000; Sucre, Oruro, and Potosí, each about 25,000; Santa Cruz, about 22,000; Tarija, about 8000; Trinidad, about 5000.

**EDUCATION.** Primary instruction is free and nominally compulsory, but a large part of the population is illiterate. Pupils in primary schools are reported to number about 60,000. For secondary education there are a few so-called colleges and other institutions. Opportunity for higher or special instruction is afforded by several establishments, as the university and the school of commerce at La Paz, the university and the normal school at Sucre, the school of languages at Potosí, the agricultural and veterinary school at Cochabamba, and the schools of mines at Potosí and Oruro. Roman Catholicism is the established religion; the exercise of other forms of worship is permitted. Civil marriage is obligatory under a law of 1912.

**PRODUCTION AND COMMERCE.** Economic prosperity derives from the large mineral resources of the country. Agriculture is important only

to meet local needs and not as a factor in the foreign trade. Products of the soil include corn, barley, rice, potatoes, beans, etc., as well as coffee, cacao, coca, and quina. More important than any of these is rubber, large quantities of which are gathered in the northern forests. Rubber stands second to tin in its export value, which among South American countries is exceeded only by that of Brazil. The metals produced in commercial quantities, besides tin, include silver, copper, bismuth, gold, antimony, lead, zinc, and tungsten. Among the tin-producing countries of the world, Bolivia ranks second only to the Federated Malay States. Of the world's output in 1915, the Federated Malay States are credited with over 50 per cent and Bolivia with nearly 30 per cent. The commercial centre of the Bolivian tin industry is Oruro; other tin districts are La Paz, Potosí, and Chorolque. The lodes are found at altitudes varying from 11,000 to 16,000 feet.

Imports and exports have been valued as follows, in thousands of bolivianos:

	1910	1911	1912	1913	1914
Imports ...	48,802	58,371	49,509	54,763	39,761
Exports ...	74,567	82,631	90,123	93,722	65,801

The boliviano is worth approximately 39 cents. On this basis, the value of the imports in American money was \$21,357,505 in 1913, and \$15,506,876 in 1914; exports, \$36,551,390 and \$25,662,447. By classes imports and exports have been as follows, in thousands of bolivianos:

	Imports		Exports	
	1913	1914	1913	1914
Live animals .....	2,230	1,913	117	239
Food and drink .....	10,354	9,508	28	75
Raw material .....	4,707	5,198	90,001	59,879
Manufactures .....	34,096	20,017	261	287
Gold and silver, incl. coin.	3,377	3,125	3,314	5,322
<b>Total .....</b>	<b>54,763</b>	<b>89,761</b>	<b>93,722</b>	<b>65,801</b>

The principal imports are cotton and woolen goods, provisions, machinery and hardware, wines and spirits, and apparel. The chief exports, valued in thousands of bolivianos, were as follows in 1913 and 1914 respectively: Tin concentrates, 67,784 and 42,480; rubber, 14,652 and 8280; silver, 2784 and 2531; bismuth, 2093 and 2377; copper concentrates, 2774 and 2369; gold coin, 154 and 2479; coca, 682 and 651; wolframite (tungsten ore), 415 and 428; hides, 360 and 286; lead ore, 353 and 155. The export of tin concentrates amounted to 44,595 metric tons in 1913 and 37,260 in 1914; rubber, 5143 and 4485; copper concentrates, 4029 and 3874; bismuth, 422 and 438; wolframite, 282 and 276. Of the tin concentrates, 35,957 metric tons, valued at 40,991,055 bolivianos, were exported to the United Kingdom, and 1115 tons, valued at 1,274,889 bolivianos, to Germany. Of the copper concentrates, 2124 tons, valued at 1,301,892 bolivianos, were exported to France, and 1613 tons, valued at 984,142 bolivianos, to the United Kingdom.

Imports and exports, in thousands of dollars, by countries:

	Imports		Exports	
	1913	1914	1913	1914
Germany .....	7,886	4,144	8,110	1,489
United Kingdom .....	4,880	8,045	29,548	20,255
Chile .....	2,168	2,140	230	484

	Imports		Exports	
	1913	1914	1913	1914
United States .....	1,577	1,808	218	956
Peru .....	1,180	1,115	13	395
Argentina .....	1,287	1,006	856	345
Belgium .....	881	899	1,237	736
France .....	803	418	1,783	1,036
<b>Total, incl. others....</b>	<b>21,858</b>	<b>15,507</b>	<b>36,551</b>	<b>25,662</b>

COMMUNICATIONS. The length of railway in operation was stated in 1916 to be 1305 kilometers (811 miles), and that under construction 605 kilometers (376 miles). Bolivia has access to the sea by three lines of railway, the terminals being the Chilean ports of Antofagasta and Arica and the Peruvian port of Mollendo. The principal line extends from Antofagasta to the frontier town Ollagué, a distance of 440 kilometers, and thence through Uyuni, Rio Mulatos, Challapata, Poopó, and Machacamarcá to Oruro, the distance in Bolivian territory being 482 kilometers. There is connection at Oruro for Viacha (202 kilometers), which is also on the Guaqui-La Paz line and the line from Arica; the distance from Viacha to Alto de La Paz is 23 kilometers. The remaining distance, 8 kilometers, to La Paz, has been covered by an electric line, but it was expected that steam communication would be established by the end of 1916. The distance from Viacha to Guaqui, on Lake Titicaca, is 65 kilometers; Guaqui has steam connection with Puno, on the Peruvian shore, whence there is rail to Mollendo. The line from Arica to Alto de La Paz is 439 kilometers long, the Bolivian section being 233 kilometers. The total distance from La Paz to Antofagasta is 1155 kilometers, from La Paz to Mollendo 861 kilometers, and from La Paz to Arica 447 kilometers.

The La Paz-Yungel Railway was opened for traffic late in 1916 and is a line approximately 137 miles long. A project discussed during the year was the Potosí-Sucre Railway, an extension of the Rio Mulato branch of the Antofagasta and Bolivia Railway. As no bids were received for the construction by outside contractors the government decided to proceed with the building through its own Department of Public Works.

Telegraphic communication is established with foreign countries and between the principal towns, including all the departmental capitals. In 1912 the length of line was 6133 kilometers; wire, 8951; number of offices, 194. There are several radiotelegraphic stations. Post offices are reported to number 317.

FINANCE. The standard of value is gold. The monetary unit is the boliviano; its par value is 38,932 cents, or 12.5 bolivianos to the pound sterling. For the fiscal year 1915, the budget showed estimated revenue of 25,263,500 bolivianos and estimated expenditure of 24,630,702 bolivianos. The estimated revenue comprised: import duties, 9,975,850 bolivianos; export duties, 4,825,000; taxes, 6,753,000; other receipts, 3,709,650. Estimated departmental disbursements: finance, 9,360,820 bolivianos; war and colonization, 5,714,675; interior and fomento, 3,771,326; public instruction and agriculture, 2,562,468; justice and industry, 1,786,297; foreign affairs and worship, 945,934; Congress, 480,182. The foreign debt, as reported for 1915, amounted to about 36,821,700 bolivianos; internal debt, 16,442,000.

GOVERNMENT. The executive power is vested

in a president, who is elected by direct vote for four years and is ineligible for the next term. Two vice-presidents are elected for the same period. There is a cabinet of six ministers. The legislative power is exercised by a congress of two houses, the Senate and the Chamber of Deputies. Senators (numbering 16) are elected for six years, and deputies (75) for four years, all by direct vote. The suffrage is held by every male citizen over 21 years of age who is able to read and write and has a fixed, independent income. The President in 1916 was Ismael Montes, who succeeded Eliodoro Villazón Aug. 14, 1913. First Vice-President, Juan M. Saracho; second Vice-President, José Carrasco.

**BOLL WEEVIL.** See COTTON.

**BOLTON, SARAH KNOWLES.** An American author, editor, and temperance worker, died Feb. 21, 1916, in Cleveland, Ohio. Born in Farmington, Conn., in 1841, she studied at Hartford Seminary and later spent two years in Europe, studying and investigating industrial conditions. In 1866 she was married to Charles Edward Bolton, who died in 1901. For three years she served as associate editor of the *Congregationalist*, Boston, and her activities in the National Woman's Christian Temperance Union and the American Humane Education Society brought her the post of assistant corresponding secretary in the former and that of vice-president in the latter. Mrs. Bolton published a number of books in a series called "Famous Men and Women" and including *Poor Boys Who Became Famous* (1885); *Famous American Statesmen* (1888); *Famous Types of Womanhood* (1892); *Famous Givers and their Gifts* (1896), and similar titles; also stories and biographical monographs.

**BOOTH, CHARLES.** An English sociologist and statistician, died at Gracedieu Manor, Leicestershire, Nov. 23, 1916. Born in 1840 in Liverpool and educated there, at 22 he became a partner in the family shipping business of Alfred Booth and Company and for many years before his death he was on the board of the Booth Steamship Company. With these interests he was almost entirely identified until 1886, when he undertook the great work that made him famous—the preparation, by painstaking research and an exhaustive collection of data, of a series of books called *Life and Labor of the People in London*, the first volume of which appeared in 1889 and the last of 10 in 1903. This work was of the highest importance, not only for itself, but because it revolutionized the methods of poor relief, and while stimulating interest in social work removed it from the plane of the sensational or sentimental. Mr. Booth divided the inhabitants of the metropolis into eight classes, and determined the character of every street. Graphically he presented his results in a colored map. He wrote also several books on old age pensions. The author served as president of the Royal Statistical Society in 1892-94, became a Privy Councillor, and a fellow of the Royal Society, and received honorary degrees from Oxford, Cambridge, and Liverpool.

**BOOTS AND SHOES.** In this important industry in 1916 the abnormal conditions generated by the great war continued, while at the same time the changes due to fashion had an economic effect far from negligible. In the United States the year was one of general prosper-

ity for the manufacturers and record prices prevailed, yet the high cost and scarcity of materials required intelligent and careful supervision of manufacturing. Naturally there was an abnormal demand for leather in both the foreign and domestic trade, but supplies were forthcoming at high prices so that most boot and shoe factories were being operated to capacity and many were enlarged. There were transportation problems to be faced as well as the difficulties resulting from European embargoes on hides and skins. The domestic freight embargoes also interfered with the receipt of raw materials and the distribution of the finished product. Boots and shoes in the main followed the leather market, but throughout the year there was a general apprehension that prices might soar to unheard of limits. The period of high prices started in March, when an active demand for hides, leather, and shoes brought increased prices and was also accompanied by good business through May. The conditions were a little easier in the summer but usually the advantage was with the seller. In the autumn came a European demand for sole leather typified in a Russian order for 750,000 sides and bends, and this was followed by a brisk domestic demand for shoes and leather which led to rising prices. Upper leather as well as sole leather was in demand, and when the new shoes for women were put out, which called for more leather, conditions were further disturbed and high prices for all kinds of shoes prevailed. Glazed kid was used increasingly and practically every possible material was employed for uppers with great apprehension on the part of manufacturers that some single style might predominate. The extensive use of cloth for uppers saved the price of leather and the yardage turned to this purpose was considerable. With fashion demanding colored shoes there was a shortage of dye stuffs, and this was met in part by using vegetable dyes or even pigment paints which were made up into paste and spread upon the leather. An interesting item of the year was that one manufacturer who had made over 600,000 pairs of shoes for the United States army on the last developed by Surgeon Major Munson of the army, intended to supply to the general public shoes made on similar lasts.

While complete statistics for the American shoe industry were not available at the end of the year the production of Brockton, Mass., may be cited as typical. In 1916 its factories shipped 795,634 cases as compared with 694,919 in 1915.

The imports and exports of boots and shoes into and from the United States for three successive periods may be of interest, the 10 months ended October being taken in each case.

IMPORTS FOR 10 MONTHS ENDED OCT.

	1914	1915	1916
Boots and shoes . . . . .	\$418,258	\$192,064	\$152,806
Total upper leathers . . . . .	3,388,000	2,035,259	2,488,946

EXPORTS

	1914	1915	1916
Boots and Shoes:			
Children's . . . . .	\$1,875,300	\$ 1,590,683	\$ 2,288,054
Men's . . . . .	7,511,279	25,392,896	25,658,333
Women's . . . . .	4,856,857	4,984,195	8,847,641
Slippers . . . . .	280,110	160,797	285,140

The American public generally were disturbed by rumors of extraordinary increases in

prices of footwear towards the end of the year, but such feelings were based upon apprehension rather than any definite market or economic tendencies.

In Great Britain the leather industries were working during the year under great pressure. For government supplies alone England had endeavored to make purchases in every possible corner of the world and still there was scarceness. Even the high legs of women's fashionable boots figured in a question asked in the House of Commons as an extravagant tendency to be curbed. Cloth was being used increasingly and the greatest economies were practiced. In Germany all leather had become scarce and was under government control with the use of hides restricted. In France an interesting development was the consideration that was being given to the leather industries. There had been a general reluctance to adopt modern machinery to the fullest extent, but this was to be remedied, and with France normally a large exporter, it was hoped that there would be increased production with the restoration of peace conditions. See LEATHER.

**BOSELLI, PAOLO.** An Italian statesman, appointed prime minister on June 24, 1916. A member of an old family of Savona, he was born in 1838. As doctor of laws he graduated from the University of Turin in 1860, then devoted some years to literary work, and by 1870 had taken his seat, held continuously thereafter, in the Chamber of Deputies. His interests were remarkably varied, including merchant marine, education, agriculture, and finance. Of the Council for the Mercantile Marine, which he had helped to establish, he became president in 1881; and under Crispi he served as Minister of Public Instruction from 1888 to 1891 and in 1893 as Minister of Agriculture. Later, until 1896, and again in 1899-1900, he was Minister of Finance. His moderate views, as member of the Right Centre, fitted him for the task of forming a coalition ministry. His scholarly work, including service as professor of financial science in the University of Rome, and books on social, economic, and legal subjects, brought him many honors, among them the presidency of the Italian Institute of History, the Turin Royal Polytechnic, and the Turin Royal Academy of Sciences. See ITALY.

**BOSNIA AND THE HERZEGOVINA.** See AUSTRIA-HUNGARY.

**BOSTON NATIONAL OPERA COMPANY.** See MUSIC, *Opera*.

**BOSTON PUBLIC LIBRARY.** See PAINTING AND SCULPTURE.

**BOSTON SUBWAY.** See RAPID TRANSIT.

**BOSTON SYMPHONY ORCHESTRA.** See MUSIC, sections *Orchestras* and *Novelties*.

**BOSTON UNIVERSITY.** A non-sectarian educational institution in Boston, Mass. It was founded in 1869. The total number of students in all departments at the end of 1916 was 3197, and of faculty members 197. During the year \$167,000 was received in benefactions. The University has \$2,457,301 productive funds and \$423,778 income. The library contains 63,000 volumes. President, Lemuel Herbert Murlin.

**BOTANY.** Among the botanists of note who died within the past year were: Dr. T. J. Burrell, who discovered the cause of pear blight, the first bacterial disease of plants to be demonstrated; Dr. H. E. Hasse, the well-known Ameri-

can lichenologist; Paul Sorauer, founder and editor of *Zeitschrift für Pflanzenkrankheiten*; Dr. Edouard Heckel, the tropical botanist; Count Solms Laubach, the eminent palaeobotanist; Dr. Heinrich Rehm, one of the world's authorities on Ascomycetes; and Charles René Zeiller, the French palaeobotanist. New serial publications to appear were: *Genetics*, devoted to research in heredity; *Materialy*, a Russian journal of plant pathology; *The Quarterly Bulletin* of the Florida Plant Board; *Addisonia*, a quarterly publication of the New York Botanical Garden; and a Japanese Journal of Plant Protection, the official publication of the Nippon Plant Protection Society.

Foreign and domestic quarantines are in effect in the United States on account of plant diseases, the introduction of sugar cane, white and other five-leaved pines, currants, potatoes, maize, citrus stock, etc., being prohibited wholly or in part.

Investigators in ecology have published extensively, Harshberger, Shreve, Harper, McBride, Nichols, Turesson among American ecologists having contributed the results of some of their studies. Taxonomic notes and monographs on various groups of plants or contributions to the floras of regions have been numerous during the year. Bartlett described a new guayule; Goldman, three new species of oaks; Griffiths, new species of *Opuntia*. Hallier has written on the flora of Borneo; Naki, on the woody plants of Korea; Pittier, on new species from Central America; Rowlee, on plants of Patagonia; Sudworth, on spruces and firs of the Rocky Mountain region; Trelease, a monograph of *Phoradendron*; Britton, West Indian plants; Merrill, on the flora of the Philippines, Borneo, etc.; Maxon, tropical American ferns; Murrill, on mushrooms, etc. Reichert claims a study of the proteins and carbohydrates of plants reveals generic and specific characters that can be utilized by taxonomists.

**PLANT BREEDING.** Bartlett has described mass mutation in *Oenothera* and de Vries has given an account of the behavior of a Mendelian mutant of the same genus. Laberge reported two new mutants of *Solanum commersonii*. A number of investigators have made studies of the pollen of plants as an indication of their hybrid origin. Holden, from a study of species of *Epilobium*, concludes that the presence of abortive pollen grains is evidence of hybridity in species which are generally considered valid, thus confirming Jeffrey in this regard. The theory has been recently advanced that many of the numerous species of *Cratægus* are natural hybrids. Gates and Goodspeed claim that sterility of pollen may be due to a number of causes, hybridity being only one of them. Jones and Rayner caution against the splitting of species without regard to breeding tests. Evidence of parthenogenesis has been found in *Primulas* in a study of some of their hybrids. Benedict has described a number of discontinuous variations in the Boston fern. The inheritance of certain characters in oats and maize has been described by Pearl and Surface. East has reported a fertile hybrid between *Nicotiana langsdorffii* and *N. alata*. From a study of hybrids between *Fuchsia* and *Tripsacum*, Collins and Kempton have recognized a type of inheritance which they call patrogenesis. Harper has tried unsuccessfully to recombine the endosperm colors in maize

by making a series of crosses. Biffin found certain dominant characters in wheat may be suppressed and their recessives may appear in the  $F_2$  generation. The abnormal occurrence of doubles in cultivated stocks is explained by Edith Saunders as due to unconscious selection by gardeners, the singles usually being weak plants. Daniel has recently described four graft hybrids that, he claims, appeared in his experiments.

**PLANT PHYSIOLOGY, ETC.** Guilliermond has added to our knowledge regarding the occurrence and function of chondriosomes in plants, and Moreau claims that they arise from preëxisting ones but that mitochondria whose function is to secrete do not divide and those which do divide have no part in secretion. Mottier questions whether other bodies within the cell may not also be chondriosomes. The permeability of cells to different ions has been a subject of much investigation. Osterhout has continued his studies on antagonisms and has described the action of certain paired salts. Fittig, Panatelli, Czapek, and others have contributed the results of their investigations on the absorption of salts by plants. Acqua has shown that plants readily take up substances in solution through their leaves or cut ends of branches, the injury in the latter case needing to be only very slight. Gile and Carrero claim that iron is not translocated from one part to another in rice plants grown in cultures deficient in iron. Willstätter has continued his studies on chlorophyll and finds that in photosynthesis, chlorophyll acts in conjunction with an indispensable enzym. Jorgensen and Kidd, experimenting with pure chlorophyll in the presence of carbon dioxide, found pheophytin formed, their independent experiments confirming those of Willstätter. Spoehr considers very doubtful the theory that formaldehyde is the intermediate product of photosynthesis. He favors the idea that formic acid is produced under the circumstances. Raikow advances the theory that half the oxygen of plants is derived from carbon dioxide, the balance from water within the plant.

Livingston has described a method by which a single index is made to represent the moisture and temperature conditions as related to plants. Both porometer and standardized cobalt paper were found by Trelease and Livingston to measure fairly accurately the transpiring power of plants. Briggs and Shantz found plants undergo changes during the day that may modify their transpiration current. Muenscher claims that variations in the amount of transpiration in plants cannot be attributed to the size and number of stomata. The question of ascent of sap continued to be a matter of controversy among botanists. Copeland, from a review of the literature, claims that the evidence favors the theory that living cells are not essential to the movement of water in stems. Renner, Halle, and Ursprung, from independent investigations, give added evidence in favor of the cohesion theory of the rise of sap. Bailey, from a study of the bordered pits of conifers, found that they are permeable to undissolved gases at pressures below those considered necessary for explaining the tension theory of ascent of sap. The varying content, seasonal fluctuation, and variation of sap in different parts of the same plant have been shown by Dixon, Atkins, Shedd, and others.

Continued experiments on the electric stimulation of plants with high tension currents

showed, while there might be accelerated growth in some cases, the results were not of economic application. Koernicke found that Röntgen and other rays act like toxic substances in general, having a stimulating effect in small dosage, an injurious effect when applied in large amounts. Montemartini failed to find any specific action by ultraviolet rays on the reproductive organs of plants. Sutton has shown that radium preparations have no economic value so far as the growth of plants is concerned. Knudson found galactose toxic to peas, although it was utilized by fungi. The injurious action was overcome by adding glucose to the medium. Molliard reports that potatoes produce aërial tubers when grown in close confinement, and Vilikovsky found starch deposited in the stems when it is formed too rapidly to be transferred to the tubers. Hartwell claims that starch is produced by plants whenever growth is retarded.

The electrical response test of Waller has been successfully applied to determine the percentage of vitality in seeds. Leitch has proposed a new cardinal point in the relation of growth to temperature which she calls the maximum rate temperature. It is the temperature at which greatest growth occurs when time is considered as a factor. Lipman finds that there is no definite lime-magnesium ratio for certain groups of plants, as claimed by Loew. Doyle has shown that the petioles of certain plants can function as stems when stems are grafted upon them. Moreau claims that there are certain colorless compounds of mitochondrial origin which must be classed as anthocyanins. Williams and West found the hydrocyanic content of sorghums to be increased by any agency that checks rapid growth. Benedict claims that the senile changes observed by him in *Vitis Vulpina* are due to accumulated catabolic products.

Howard has concluded his studies on the rest period of plants, which he found to be due to the inhibition of enzym activity and to be broken by the activation of the enzymes by stimulating agents. Lakon claims that annual periodicity of woody plants is not inherent but is due to environmental conditions. Molliard has presented additional evidence showing that plants excrete substances through their roots which are toxic to the same kind of plants. Löhnis and Smith have found that the life cycle of bacteria embraces several subcycles, and that all bacteria pass through an amorphous or symplastic phase in which they are filterable but are able to reproduce their type. Studies on the distribution and action of soil fungi and bacteria have been reported by many investigators. Fred found that the turning under of green manure crops is often detrimental to the germination of seeds of subsequent crops, probably through the development of parasitic fungi. E. F. Smith has submitted additional data to prove that crown gall of plants is cancer.

**PLANT DISEASES.** Among so-called physiological diseases, or those whose cause is unknown, serious injury due to smelter fumes has been reported by the Selby Smelter Commission. Chivers found garden plants seriously injured by fumes from tarvia used on roads. A disease of cucumbers, known as mosaic, has become serious in several States. Black heart of potatoes appears to be associated with rather high temperatures in storage. A disease of greenhouse tomatoes in Canada and elsewhere is believed to



be due to some soil condition. Allard has shown that the mosaic disease of tobacco may be transferred to petunias and tomatoes, but that it is not transmitted by seed. Tubeuf claims that ivy injures the supporting plant by the power of constriction only.

Bacterial diseases not previously reported are described by investigators in many countries. Among those recently published upon are: A bacterial disease of western wheat grass, described by O'Gara; a rotting of potatoes in India; a rot of tomatoes in Italy; a disease of cucumbers in Russia, caused by *Bacillus burgeri*; a bacterial rot of cucumbers in Italy; a blight of field and garden peas in Colorado, described by Sackett as due to *Pseudomonas pisi*; a disease of cassava in Brazil; and a disease of soy bean leaves reported in Nebraska by Heald and in Connecticut by Clinton. Rolfs has published an account of his investigations on the angular leaf spot of cotton, which is due to *Bacillus malvacearum*. The fire blight (*Bacillus amylovorus*) has been found to attack leaves, flowers, fruits, twigs, and trunks of apple and pear trees, and to occur also on peach, cherry, and other trees in the northwestern part of this country. The organism is said to retain its vitality for from 10 to 27 days in branches cut from trees. The bacterial wilt of cucumbers has been found to be transmitted almost entirely by beetles. A bacterial disease of barley occurs in Wisconsin and a number of other States.

Arthur has given the results of 15 years' study of cultures of Uredineæ. The stripe rust of cereals, due to *Puccinia glumarum*, has made its appearance on wheat in several western States. A new smut of Johnson grass is reported in South Africa, and a smut on rice is said to occur in Louisiana and Texas.

The white pine blister blight, in addition to occurring in New England and neighboring States, is also reported in Minnesota and Ontario, being found on both the pine and the currant. It is also said to cause considerable injury in white pine plantations in England, Germany, and elsewhere in Europe. The chestnut blight is spreading rapidly and it has been recently found in Ohio. The citrus canker, which is of bacterial origin, is proving very destructive to grapefruit trees in Florida and adjacent States. All kinds of citrus trees are subject to its attacks, and an active campaign is being waged in all the Gulf States for the eradication of the disease. Investigations in Virginia and West Virginia have shown that apple rust may be controlled by the destruction of all cedar trees within a radius of a mile about apple orchards. The cottony rot of lemons in storage is due to *Sclerotinia libertiana*, according to Smith. The related *S. cinerea* is said to cause blossom blight and rotting of prunes in the Pacific States. Sackett has recently described a disease of raspberries as due to *Sphaerella rubi*.

The mildews have been quite destructive to grapes in France where spraying has been neglected on account of the cost of materials. Potatoes are reported as seriously affected in many regions and some new rots due to *Fusariums* have been described. A rotting of onions in storage, due to attacks of *Sclerotinia cepivorum*, is reported in Ohio. Edgerton has found the bean anthracnose fungus unable to withstand summer temperatures in Louisiana. The fungus which causes cotton wilt has been found by

Wolf to attack peanuts and potatoes. A stem rot of watermelons, caused by a *Diplodia*, has been recently described. Information regarding plant diseases in the tropics is being rapidly added to by the investigations of Petch, Johnston, Rutgers, Fawcett, Rorer, and others. Many reports have been published in the European scientific press on diseases of common field, orchard, and garden crops, with suggestions for the conservation of such crops through the proper use of fungicides. In the Philippines, it has been found possible, by pruning and spraying the trees with Bordeaux mixture, to prevent losses on coffee due to *Hemileia vastatrix*.

Johnson, in Hawaii, found spraying pineapple plants with a solution of iron sulphate would control a serious chlorosis of that plant. The efficacy of treating grains and other seeds with fungicides has been demonstrated for the prevention of many serious diseases, and Johnson in Wisconsin found warm solutions of formalin more effective than cold ones for smut and other diseases of barley. Hot water sprayed on plants has also been found to have an important fungicidal value. Lime-sulphur is being extensively used as a summer spray, as it does not scorch fruit so much as does Bordeaux mixture. The adhesiveness of Bordeaux mixture can be increased by the addition of flour paste. Experiments with fungicides in a dry state have given good results for certain leaf diseases of nursery stock. Morse has shown that lead arsenate, in addition to being an important insecticide, has considerable value as a fungicide.

**Bibliography.** Among recent botanical books, the following may be noted: C. J. Chamberlain, *Methods in Plant Histology*, 3d ed. (Chicago, 1915); C. M. Child, *Individuality of Organisms* (Chicago, 1915); E. M. Dunham, *How to Know the Mooses* (Boston, 1916); C. S. Gager, *Fundamentals of Botany* (Philadelphia, 1916); W. Giltner, *Laboratory Manual of Microbiology* (New York, 1916); C. A. Hall, *Plant Life* (London, 1915); E. O. Jordan, *General Bacteriology*, 5th ed. (Philadelphia, 1916); Geo. Massee, *Diseases of Plants and Trees* (London and New York, 1915); H. L. Russell and E. G. Hastings, *Agricultural Bacteriology* (Madison, Wis., 1915); W. C. Stevens, *Plant Anatomy*, 3d ed., revised (Philadelphia, 1916); A. D. Webster, *Tree Wounds and Diseases* (London, 1916); F. E. Weiss et al., *Plants in Health and Disease* (London, 1916).

**BOUCICAULT, MRS. DION.** See ROBERTSON, AGNES.

**BOWDOIN COLLEGE.** A non-sectarian institution for the higher education of men, founded at Brunswick, Maine, in 1794. In the autumn of 1916 there were 488 students and 93 faculty members. The institution has available in productive funds \$2,401,653, from which it draws an income of \$156,182. The Bowdoin library contains 113,000 volumes. President, William DeWitt Hyde.

**BOWLING.** The sixteenth annual tournament of the American Bowling Congress was held at Toledo, Ohio, in March. Frank Shaw of Chicago, Ben Huesman of Cincinnati, Sam Schliman of Toronto, Canada, and R. Raydl of Chicago tied for the individual honors with a score of 685. The winners in the other events were: Two-man, Thomas and Marino, Chicago, 1279; five-man, Commodore Barry's team, Chicago, 2905.

G. Cook of Brooklyn won the individual title in the tenth annual tournament of the National Bowling Association with a score of 747. The other victors were: Two-man, L. Marino and C. Hummel, Brooklyn, 1312; five-man, Quakers' team of Philadelphia, 2953; all events, G. Cook, Brooklyn, 1948. The Seattle A. C. won the telegraph match open to five-man teams of the United States and Canada with a total of 3146. The Detroit A. C. finished second with 2895 and the Illinois A. C. third with 2889.

**BOXING.** Professional boxing had a dull year in 1916. Few bouts of importance were held and no titles changed hands. The champions at the various weights are Jess Willard, heavyweight; Al McCoy, middleweight; Jack Britton, welterweight; Fred Welsh, lightweight; Johnny Kilbane, featherweight; and Johnny Erle, bantamweight.

The bout that attracted the most attention during the year was that between Jess Willard and Frank Moran in Madison Square Garden, New York City. The affair was a disappointment to the followers of the sport, the heavyweight champion merely demonstrating that he could not be disposed of in a ten-round bout. Welsh successfully defended his lightweight title in a battle with Charley White of Chicago and Kilbane emerged victorious in his bout with George Cheney.

The arrival of Les Darcy, the Australian middleweight champion, in the United States in December, revived interest in the sport and it is possible that the year 1917 may see bouts of international flavor contested.

An attempt was made by Tex Rickard and other boxing promoters of the United States to have Georges Carpentier, the French champion, come to New York and engage in at least one bout, the understanding being that part of the proceeds should be turned over to the Red Cross. Carpentier was serving in the French army and in order to carry out this plan the assent of the French military authorities must be obtained. The necessary arrangements may be made in the spring of this year.

Amateur boxing had a big boom in 1916. Early in the year three of the leading amateurs of the United States visited the Scandinavian countries and took part in various tournaments held there. The men who made the trip were: William Spengler of the Union Settlement, New York, T. Maloney of Philadelphia, and John Kirpinaky of Cleveland.

The championships of the Amateur Athletic Union were held at Boston in April. The results of the final bouts were: 108-pound class—Thomas Darcy, Boston, defeated Izzy Wiesel, Providence; 115-pound class—Ben Valger, Educational Alliance, New York, defeated Tony Vatlan, Brighton; 125-pound class—William Morris, East Side House, New York, defeated Dave Brown, Toronto, Canada; 135-pound class—Thomas Murphy, Kansas City, Mo., defeated John Marto, East Boston; 145-pound class—Eugene Brosseau, Montreal, Canada, defeated Mike Stark, 92d St. Y. M. H. A., New York; 158-pound class—Adolph Kaufman, Trinity Club, New York, defeated Joseph Landrien, New Orleans; 175-pound class—Patrick McCarthy, Roxbury, Mass., defeated Charles Shons, Pittsburgh, Pa.; heavyweight class—Carlo Armstrong, Boston, defeated George Hook, Pittsburgh, Pa.

**BOYCOTT.** See LABOR, AMERICAN FEDERATION OF.

**BOY SCOUTS OF AMERICA.** The number of Boy Scouts enrolled throughout the world is estimated at not less than 1,000,000, one-fifth of whom are in the United States. The ideals of the movement are efficient citizenship, service, and character building. "The Boy Scouts of America," the name under which the movement in the United States was incorporated Feb. 8, 1910, has as its honorary president, Woodrow Wilson, and as honorary vice-presidents, William H. Taft and Theodore Roosevelt. The active president is Colin H. Livingstone and the national scoutmaster is Daniel C. Beard. A group of men, brought together as a local council for the promotion of Scout work, receives a charter from the national organization. In many cases this council engages a scout executive to be leader of the scoutmasters. The Scouts are organized in patrols and troops. Eight boys constitute a patrol, one being chosen as the patrol leader. Three patrols make up a troop. The scoutmaster is the adult leader of the troop. Already there are about 700 local councils in as many cities throughout the United States and under the direction of each there are from 5 to 150 scoutmasters in charge of troops. Any boy of any class or creed, over 12 years of age, is eligible to become a Scout. The initial requirement is that he take the Scout oath. By meeting certain requirements, he is in line to become a Tenderfoot, Second-class Scout, and First-class Scout. Scoutcraft includes instruction in first aid, life saving, tracking, signaling, cycling, nature study, seamanship, campcraft, woodcraft, chivalry, and all the handicrafts.

It is a prime purpose of the Boy Scout movement, abroad as well as in the United States, to teach boys that to create is better than to destroy, and that peace, not war, will make a great nation. Splendid first aid and other humanitarian services have been rendered by the Scouts in the present European war.

**BRANDEIS, LOUIS DEMBITZ.** An American lawyer, who, on June 5, 1916, became a member of the United States Supreme Court. He was nominated by President Wilson the preceding January 28th, but the nomination was not confirmed until June 1st. The suggestion of his name was credited to Attorney General Gregory. Mr. Brandeis, who had not been considered as a possible candidate for the seat left vacant by the death of Mr. Justice Joseph Rucker Lamar, had long been known for legal activities connected with the public interest. He was counsel for Mr. Glavis in the Ballinger-Pinchot investigation in 1910, and for shippers in the advanced freight rate investigation before the Interstate Commerce Commission in 1911, and counsel for the people in supporting the constitutionality of Oregon, Illinois, and Ohio laws providing shorter working hours for women. He prevented the Boston subways from falling into private control, and was responsible for the Boston sliding scale gas system. In 1906-13 he opposed the New Haven Railroad's policies as resulting in a monopoly of transportation in New England. In 1910 he stated that efficient methods would save the railroads of the country \$300,000,000 a year, making an increase in freight rates unnece-

sary. Mr. Brandeis made some of his bitterest enemies among railroad men, although in 1913-14, in the rate hearings, his views often favored their case. As a representative, sometimes unpaid, of minority stockholders and of labor in disputes with capital, as a labor arbitrator (notably in the New York garment workers' strike in 1910), and as a leader of the Jews in the Zionist movement, Mr. Brandeis was known throughout the country. When he was nominated for the Supreme Court bench, much opposition developed. A sub-committee of the judiciary committee of the Senate held public hearings, at which 47 witnesses were heard and 1500 pages of testimony were taken. President A. Lawrence Lowell of Harvard and seven former presidents of the American Bar Association protested against the choice, while ex-President Eliot of Harvard and other prominent men approved it. Finally the Senate confirmed the nomination by a vote of 47 to 22; the vote divided closely on party lines, the Democrats upholding the President's choice. Mr. Brandeis was the first Jew to sit on the Supreme Court bench. He was born in 1856 in Louisville, Ky., studied for two years in Germany, and graduated from Harvard Law School in 1877. In practice in Boston from 1879, he was a member of the firm of Warren and Brandeis till 1897, and thereafter head of the firm of Brandeis, Dunbar, and Nutter. Harvard gave him an honorary A.M. in 1891.

**BRATIANO, J. J. C.** See RUMANIA.

**BRAUN, LILY.** A German feminist, Socialist, and writer, died Aug. 9, 1916, at Berlin. Coming of a distinguished family, named von Kretschman, she was born in 1865 at Halberstadt. She was married first to Prof. Georg von Gizycki, and after his death, to Dr. Heinrich Braun of Berlin. By her lectures and writings she became known as a leader in the woman's movement in Germany. She did much to advance social reforms. Because of her socialistic ideas and associations, she was disinherited by a wealthy aunt, the Countess Klottilde von Herman. Besides publishing many brochures and articles, among the last of which was one on women in their relation to the great war ("Die Frauen und der Krieg," in *Zwischen Krieg und Frieden*, 1915), Frau Lily Braun published the following books: *Deutsche Fürstinnen* (1893); *Die Frauenfrage* (1901); *Im Schatten der Titanen; Erinnerungen an Baronin Jenny von Gustedt* (1908, 54th thousand, 1914); the important *Memoiren einer Socialistin* (2 parts, 1909 and 1911); *Die Liebesbriefe der Marquise* (1912); *Mutter Maria*, a tragedy (1913); and *Lebenssucher* (1915), a notable novel.

**BRAUN, LUDWIG.** A German battle painter, died Feb. 20, 1916. He was born in Württemberg, in 1836, and after studying painting in Munich under his brother Reinhold and under Nelser, he went to Paris, where he was a pupil of Horace Vernet. His observations, and sketches made during the Danish War, the Austro-Prussian War, and particularly the Franco-Prussian War, of which latter he was the official German painter, furnished him material for many striking canvases, such as "The Entry of the German Army into Paris." Braun was particularly successful with panoramic paintings, among these being "The Battle of Sedan."

**BRAZIL, UNITED STATES OF.** A federal republic and the largest country of South America. The capital is Rio de Janeiro.

**AREA AND POPULATION.** The area is variously estimated. A planimetric calculation of the Brazilian ministry of agriculture shows 8,497,540 square kilometers (3,280,900 square miles). The population at present is conjectural. The census of 1890 returned a population of 14,333,915, and that of 1900 17,318,556. A 1913 estimate is 24,308,000, but, although the number of inhabitants has undoubtedly increased with some rapidity, it is not unlikely that this figure is too high. The table below shows by states the estimated area and the estimated population (in 1913) in thousands, together with the state capitals and the number of their inhabitants (in 1913), in thousands. It should be noted that various estimates of the urban population are published and that the figures given here can only be regarded as probably the most nearly correct.

	Sq. km.	Pop.	Capitals	Pop.
Alagoas	58,491	800	Maceió	40
Amazonas	1,894,724	500	Manáos	60
Bahia	426,427	2,560	São Salvador	300
Ceará	104,250	1,000	Fortaleza	65
Espirito Santo	44,889	480	Victoria	30
Goyas	747,311	308	Goyas	25
Maranhão	459,884	600	São Luis	50
Matto Grosso	1,378,788	300	Cuyabá	30
Minas Geraes	547,855	4,850	Beilo Horizonte	40
Pará	1,149,512	760	Belém	170
Parahyba	74,781	650	Parahyba	35
Paraná	251,904	570	Curitiba	60
Pernambuco	128,895	1,650	Recife	250
Piauy	301,797	450	Theresina	30
Rio de Janeiro	68,982	1,250	Nichtheroy	60
Rio Grande do Norte	57,485	480	Natal	20
Rio Grande do Sul	236,553	1,750	Porto Alegre	147
Santa Catharina	48,535	510	Florianopolis	25
São Paulo	290,876	3,200	São Paulo	400
Sergipe	39,080	500	Aracajá	32
Federal District	1,118	1,000	.....	...
Acre Territory	191,000	195	Rio Branco	5
Brazil	8,497,540	24,308	Rio de Janeiro	1,000

In the foregoing table the city of Rio de Janeiro and the Federal District are regarded as coextensive although the area of the city proper is smaller than that of the District. Estimated population of the city, Dec. 31, 1915, 961,822. Immigrants to Brazil numbered 82,572 in 1914, as compared with 192,684 in 1913; arrivals at Rio de Janeiro in 1914 were 38,918, and at Santos 47,570. The immigrants of 1914 included 27,923 Portuguese, 18,945 Spaniards, 15,552 Italians, 3675 Japanese, 3456 subjects of Turkey, and 2958 subjects of Russia.

The greater part of the population is illiterate. Elementary education, which is free, secular, and in some states nominally compulsory, has made considerable progress in recent years. Schools of all kinds number about 13,000, with an estimated enrollment of about 750,000. There are a number of secondary, normal, special, and technical schools. Instruction in agriculture is encouraged by all of the state governments. Brazil has no university, but in several of the large cities are faculties of law, medicine, and engineering. The Brazilians are almost wholly Roman Catholic, but Church and State are separate, and the exercise of all religious forms is permitted.

**PRODUCTION.** About four-fifths of the world's coffee is produced in Brazil and over one-half

in the state of São Paulo. Coffee is the crop of first commercial importance. Besides São Paulo the principal coffee-producing states are Rio de Janeiro, Espírito Santo, and Minas Geraes. The average annual production is estimated at about 12,000,000 sacks (one sack = 60 kilograms = 132.377 pounds). Next to coffee in importance is rubber. Most of the product grows in the natural forests of the Amazon region, but rubber cultivation is encouraged by the government. Other valuable crops include sugar cane, rice, cotton, tobacco, maté (hera matté), corn, manioc, bananas and other fruits, Brazil nuts, and cacao. Brazil has become the leading cacao-producing country of the world; cacao is grown especially in the state of Bahia. Sugar cane is produced chiefly in Pernambuco and other parts of the northeast; cotton, largely in the northeast; maté, chiefly in Paraná; tobacco, in Bahia and Rio Grande do Sul. In 1913 there were in Brazil about 7,289,000 horses, 3,208,000 mules and asses, 30,705,000 cattle, 10,653,000 sheep, 10,000,000 goats, and 18,399,000 swine. Since 1914 the frozen-meat industry has increased notably in importance. Mining is not greatly developed although parts of the country are rich in minerals. The greater part of the world's supply of monazite sand is produced in Brazil; other minerals exploited include manganese (the output of which has recently shown a large increase), gold, and gems. Coal (mostly inferior) and petroleum occur in considerable quantity. There are extensive iron deposits in Minas Geraes. The leading manufacture of Brazil is cotton piece goods; other manufactures of some importance are woolen and silk goods, flour, and beer. See COTTON.

COMMERCE. Below is shown the value of imports and exports, in contos (that is, thousands of milreis) gold. The milreis gold is valued at 54.62 cents.

	1905	1910	1913	1914	1915
Imports	265,156	425,529	597,034	815,312	267,452
Exports	896,828	560,814	576,488	413,571	470,847

In thousands of American dollars, the trade is represented by the following figures:

	1911	1912	1913	1914	1915
Imports	257,164	308,244	326,429	172,224	146,082
Exports	325,272	362,795	315,165	225,892	257,177

Classified imports in 1914 and 1915 respectively: live animals, 1,321,654 and 380,832 milreis gold; primary materials and materials used in the arts and sciences, 65,392,521 and 70,528,356; manufactures, 152,816,534 and 95,948,783; alimentary substances, 95,781,603 and 100,594,396. The leading imports include machinery and other iron and steel manufactures, railway materials, cotton fabrics, coal, flour, codfish, wine, arms and ammunition, kerosene, and paper. Exports are divided into three major classifications, as follows (values in contos):

	1913	1914	1915
Animals and animal products	29,613	23,114	37,819
Minerals and mineral products	6,276	7,076	10,431
Vegetable products	540,545	383,881	422,598
Total	576,433	413,571	470,847

The reported coffee export in 1914 and 1915 respectively was 11,271,000 and 17,061,000 sacks (of 60 kilos each). Quantity of the other principal exports in 1914 and 1915 is reported as follows, in metric tons: rubber, 33,531 and 35,165; tobacco, 26,980 and 27,096; sugar, 31,860 and 59,074 (in 1915, 37,981 tons, or about 64 per cent, were produced in Pernambuco); maté, 59,354 and 75,885; cacao, 40,767 and 44,980; cotton, 30,434 and 5228; leather, 31,442 and 38,324; hides, 2487 and 4573. The exportation of hides and frozen meat increased rapidly in 1915 and 1916.

Imports by principal countries, in thousands of dollars:

	1912	1913	1914	1915
United States	48,109	51,290	30,213	46,858
United Kingdom	77,616	79,881	40,958	32,029
Argentina	23,117	24,294	16,570	23,237
Portugal	14,589	14,328	8,785	7,236
France	27,751	31,940	18,486	7,217
Italy	12,096	12,366	7,033	6,443
Newfoundland	2,854	3,825	3,462	3,113
British India	1,998	2,680	1,832	2,722
Norway	8,138	8,432	2,772	2,428
Germany	53,018	57,044	27,767	2,255
Uruguay	7,718	7,047	2,641	2,172
Belgium	16,593	16,679	4,894	251
Austria-Hungary	4,895	4,928	1,746	193

Total including others	308,244	326,429	172,224	146,082
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Exports by principal countries, in thousands of dollars:

	1912	1913	1914	1915
United States	141,915	102,568	92,253	107,524
United Kingdom	43,066	41,702	32,750	31,096
France	35,515	38,686	18,591	29,285
Sweden	3,118	3,194	5,187	23,187
Netherlands	22,981	23,253	13,076	16,361
Argentina	14,329	14,848	10,680	12,990
Italy	4,096	4,067	6,768	8,073
Norway	680	482	1,517	7,614
Denmark	900	734	1,350	5,939
Uruguay	4,161	5,167	3,905	4,439
Portugal	769	1,589	2,020	2,361
Germany	51,928	44,892	22,510	0
Austria-Hungary	18,258	15,206	4,930	....
Belgium	9,729	8,093	3,613	....

Total, including others	362,795	315,165	225,892	257,177
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COMMUNICATIONS. The length of railway in operation Dec. 31, 1915, was 28,282 kilometers (16,331 miles), as compared with 26,062 kilometers (16,194 miles) Dec. 31, 1914. The following is quoted from a monograph issued by the Pan American Union in 1916:

"The railways of Brazil were originally established with the purpose of bringing the products of a contributing interior territory to the nearest seaport and of distributing to this interior the merchandise brought in from abroad. On the Atlantic coast, Recife (Pernambuco) is the focus of one system, Sao Salvador (Bahia) of another, Rio de Janeiro of a third, São Paulo and Santos (the coffee region) of a fourth, and Rio Grande do Sul, in the extreme south, of a fifth system. In recent years the government has felt the great need of connecting these various systems by interior railways running north and south, both to afford interior communication independent of the ocean and to stimulate an internal commerce and settlement. This plan has been successful north and south of Recife, so that to-day it is possible to travel by rail between

the ports of Natal and Maceió; in like manner Rio de Janeiro has been connected with São Paulo, Porto Alegre, and Rio Grande do Sul, and also with the growing port of Victoria, north of the capital. South of São Paulo, through the states of Paraná, Santa Catharina, and Rio Grande do Sul, toward the Uruguayan frontier, connection is established between the lines in these states and those of Uruguay, so that by the close of the year it was possible to travel by rail from Rio de Janeiro to Montevideo, a total length of 1967 miles (3165 kilometers). The Federal capital as well as the larger cities are served by street railways, many of which are electric lines. The many streams in the Republic are capable of furnishing an enormous power for electrical purposes, and it is proposed to electrify certain portions of the railway lines already in existence.

"Brazil has been favored by nature with a most wonderful system of fluvial arteries. It has within its territory not only the largest river basin, both in area and in length, in the world, but has also perhaps more navigable rivers than any other country. The mighty Amazon is navigable almost for its entire length, as are most of its affluents, while in the southern part of Brazil the Paraguay, Uruguay, and Paraná rivers are all navigable."

In the state of São Paulo high freight rates and other conditions had provoked a general discussion of the railway situation for several years, and the President of the state in a message to the Legislature recommended that the principal railways of the state should be leased by the state government and placed under state control. He stated that the tendency of foreign investors was to acquire railways already in operation rather than to construct new roads which would aid in the development of the country. In 1915 only 88 miles of railway were constructed, so that at the beginning of 1916 there was a total of 3893 miles of railway in the state, of which three-fourths, or 2700 miles, were owned by private corporations, 972 miles by the state, and 220 miles by the Federal government.

The President of Brazil granted a concession for the construction and operation of a railway from Cuyabá, the capital of the state of Matto Grosso, through the town of Sant' Anna, on the Paranahyba River, to connect with the Araraquara Railway at a place called Jangada, or at São José do Rio Preto. This total extension was to be about 620 miles in length, and would afford direct railway communication between Cuyabá and the ports of Rio and Santos. The concession provided that plans for the first section, 62 miles, must be submitted to the government before June 30, 1919, and construction work must be begun within one year from the date of approval of these plans by the government. Construction must be carried on at the rate of 31 miles per year. The concession called for a single track of 3.28-ft. gauge.

Federal telegraph lines at the end of 1915 aggregated 36,705 kilometers, with 68,315 kilometers of wire and 725 offices. As reported for the end of 1912, the aggregate length of all telegraph lines in Brazil was 58,257 kilometers, with 117,682 kilometers of wire and 2244 offices. Wireless telegraphy is established and the

number of stations increasing. The system of stations makes communication possible with remote regions of the interior, while the station at Belém is capable of direct communication with the United States. Post offices in 1914 numbered 3587.

**FINANCE.** The monetary unit is the milreis, equivalent to 54.62 cents. The ordinary medium of exchange is the paper milreis; its par value is 32.444 cents, but its actual value fluctuates, being in 1916 about 25 cents. The proposed budget for the fiscal year 1917, as presented to the Congress on June 5, 1916, showed a total estimated expenditure of 97,750,000 milreis gold and 406,388,000 milreis paper, as compared with 84,365,000 milreis gold and 409,850,000 milreis paper of the 1916 budget. For 1915 the estimated expenditure was 70,999,000 milreis gold and 378,862,000 paper. Public debt as reported Dec. 31, 1914: foreign, £106,050,688 and 1,569,760,320 milreis; internal, 717,002,200 milreis; floating, 245,435,538 milreis; paper money in circulation, 822,496,018 milreis.

**NAVY.** The Brazilian navy in 1916 included the following vessels: two battleships (*Minas Geraes*, 1908; *São Paulo*, 1909), with a combined displacement of 38,500 tons and 53,000 indicated horse power; 2 armored coast guards (*Deodoro*, 1898; *Floriano*, 1899), aggregating 6320 tons; 2 monitors (1905), 940 tons; 1 protected cruiser (*Barroso*, 1896), 3450 tons; 2 scout cruisers (*Rio Grande* and *Bahia*, 1909), 6200 tons, 34,000 horse power; 3 torpedo cruisers (1896-98), 3090 tons, 18,000 horse power; 10 torpedo-boat destroyers (1908-10), 6500 tons, 80,000 horse power; and river gunboats, transports, etc.

**GOVERNMENT.** The executive authority is vested in a president elected for four years by direct vote and ineligible for the next term. He is assisted by a cabinet of seven members appointed by and responsible to himself. The legislative power is exercised by a congress of two houses, the Senate and the Chamber of Deputies. Senators, 63 in number (3 for each state and 3 for the Federal District) are elected by direct vote for nine years. The deputies (212) are elected for three years. The franchise is held by male citizens not less than 21 years of age who can read and write, except soldiers actually serving and monastics under vows of obedience. The President in 1916 was Wenceslão Braz Pereira Gomes, who was inaugurated Nov. 15, 1914, in succession to Marshal Hermes da Fonseca; Vice-President, Urbano dos Santos da Costa Araújo.

The Brazilian states have elective governors and legislatures and enjoy a large degree of autonomy.

A revolutionary movement aiming at the overthrow of the government, and the establishment of a parliamentary republic by starting a mutiny among the troops was organized by the deputy Mauricio Lacerda. It was suppressed by the police on April 6th, and a number of arrests were made. The Brazilian Chamber of Deputies on October 17th voted by 103 to 5 the Arbitration Treaty which had been signed by the A B C Powers in May, 1916.

See EXPLORATION.

**BREAD.** See FOOD AND NUTRITION.

**BREEDING.** See STOCK RAISING AND MEAT PRODUCTION.

**BRENT, THEODORE.** See SHIPPING BOARD, UNITED STATES.

**BRETHREN, CHURCH OF THE.** A religious denomination known also as the Dunkers or Dunkards. There are three branches: the Conservative, the Progressives, and Old Order. There are also the Seventh Day German Brethren, numbering in 1916 about 300 communicants, 15 churches, and 6 ministers. The Conservative, the largest branch, numbered in 1916 about 97,000 communicants, 965 churches, and 3106 ministers. The Progressives had in 1916 about 24,000 communicants, 210 churches, and 300 ministers. The Old Order had about 3500 communicants, 70 churches, and 216 ministers. The Conservative group maintains 10 schools, one of which is the Bethany Bible School in Chicago, devoted entirely to study in the Bible. There is a publishing house at Elgin, Ill., where a large number of papers and books are issued. Mission work is carried on in Denmark, Sweden, India, and China. The Progressives have a publishing house at Ashland, Ohio.

**BREWING.** See LIQUORS.

**BRIAND, ARISTIDE.** See FRANCE, *History*; WAR OF THE NATIONS.

**BRICK.** See CLAY-WORKING INDUSTRIES.

**BRIDGES.** An obvious effect of the great world war was to confine largely to the neutral countries or those removed from the actual scenes of combat bridge building and other forms of constructive civil engineering. Accordingly one must look to the United States for the most important of the new projects and construction or reconstruction work, not forgetting Canada with its ill-fated Quebec Bridge whose erection was marked by another serious mishap. But in America the war had its effect in the increased cost of materials and the demands for all structural steel that prevented prompt deliveries on the taking of contracts where early shipments were involved. The quotation for structural shapes at Pittsburgh was 1.15 cents in March, 1915; 2.25 in March, 1916; 2.75 in November, 1916; and 3.15 cents in December, 1916. Plates were quoted still higher in proportion on account of the demand in ship and car building. However, there was much work to be finished and considerable new work to be put under way, including important reconstructions.

There was an increased tendency to employ concrete and reinforced concrete, and much track elevation involved important bridge design and construction, but there were few notable structures of this material comparable to the great viaducts on the Delaware, Lackawanna, and Western Railroad. For the new Galveston causeway to replace 5900 feet of paved sand-fill approaches washed out in the hurricane of Aug. 16 and 17, 1915, a board of engineers decided in favor of 60-ft. arch spans at an estimated cost of \$1,376,300. There were to be creosoted pile foundations and an improved system of reinforcement. See *Engineering Record*, Jan. 6, 1917.

Reconstruction work as well as actual new construction figured largely in the bridge work of 1916 in the United States. A notable piece of reconstruction was the bridge of the Pennsylvania Lines across the Ohio River at Louisville, Ky., to replace that built in 1869 and in continuous use from that time. Inasmuch as the United States government required a

clear span of at least 200 feet for the new draw over the Canal, the definite design was a matter of controversy and litigation, though a contract had been placed for a part of the work. The design and construction of the new bridge was to be in charge of S. C. Bland, engineer of bridges for the Pennsylvania Lines. A second bridge across the Ohio that was to be replaced was that of the Cincinnati Southern Railway, at Cincinnati, Ohio, where a structure completed in 1877 was to be removed and a double track superstructure erected on the same piers after designs by Ralph Modjeski. At Keokuk, Iowa, the Mississippi River bridge built in 1869-70 was reconstructed on the old piers, while at Omaha, Neb., the Union Pacific R. R. bridge, 1722 feet long, across the Missouri River was under reconstruction, and on December 22nd the old structure was slid on to false work and a new bridge weighing 5000 tons was slipped onto the old piers. This bridge was built in 1872, but was partially rebuilt in 1887. The reconstruction which involved an expense of about \$1,000,000 was after designs by R. L. Huntley, chief engineer of the Union Pacific R. R. The four 246-ft. river spans were rolled into place simultaneously in less than four hours and there was involved but an hour's delay to traffic.

THE HELL GATE BRIDGE was receiving its finishing touches and the two end towers had reached nearly their full height at the end of the year. The connecting viaducts and tracks were being rushed. It was stated during the year that through trains to the East beyond New Haven would be run across this bridge and through the East River tunnels and use the Pennsylvania Terminal in Manhattan. Furthermore all trains from Boston to Philadelphia and Washington naturally would make use of the new route.

THE HARAHAN BRIDGE across the Mississippi River at Memphis, Tenn., was completed and on July 15, 1916, was placed in service. The bridge, named for J. T. Harahan, consists of four spans of 2201 feet 10½ inches, a simple 345-ft. deck span on the western end and beyond that a steel viaduct 2363 feet long. The erection of the bridge was considerably delayed by unusual flood conditions and considerable of the false work was lost (see YEAR BOOK for 1915, article BRIDGES). Of the total weight of metal in the entire structure, 21,400 tons, 8900 tons are of Mayari steel. The bridge carries double railway track and on either side, supported by brackets, the highway. The bridge was designed by Ralph Modjeski. See *Railway Age Gazette*, Oct. 13, 1916.

METROPOLIS BRIDGE. The 720-ft. channel span of the Metropolis (Ill.) Bridge across the Ohio River on the new Paducah and Illinois R. R. of the Chicago, Burlington, and Quincy R. R. was successfully erected during the year and on December 11th was swung clear into place. This is the longest simple truss span ever built and is double-track, semi-pin connected and is of sub-truss Pratt type with 36-ft. sub panels. The erection work was done by derrick car and crane and the bridge was swung by lowering on hydraulic jacks and steel blocking. The bridge is also notable for the extensive use of silicon steel in the main members of the trusses and for the exceptionally high live load which was assumed in the design. See *Engineering*

*News*, July 29, 1915, June 8, 1916, July 27, 1916.

**SCIOTOVILLE AND OTHER RAILROAD BRIDGES.** There was also progress during the year on the 1500-ft. riveted span of the bridge across the Ohio River at Sciotoville, Ohio, for the Chesapeake and Ohio Northern R. R. This structure, which is continuous over three supports, was to be completed in 1917. It comprises two 775-ft. spans continuous over the middle pier and is not only a virtually new type of structure for America but at the same time the largest of the kind ever attempted. An unusual feature of the work of erection to which attention was called by *Engineering News*, was "the bending of the truss members during erection in such direction and amount as to bring all members into precisely straight condition when the completed bridge is loaded to half its live-load capacity. The object is to eliminate secondary stresses, not only in the chords but also in the web members."

At Kansas City the Chicago, Burlington, and Quincy R. R. was constructing a new bridge across the Missouri River, in which a feature was the use of heat-treated steel for some of the members. The St. Louis Municipal Bridge, which is an important factor in providing additional rail connections to that city, was being supplied with the east approach viaduct, while a notable structure completed during the year was the three-track single-leaf bascule span of the Chicago and Northwestern Railway at Chicago.

Late in the autumn of 1916 a contract for a double deck bridge and viaduct over the Kaw River at Kansas City was let by the Kansas City Terminal. This project involved the use of 25,000 tons of steel and was an important element in the terminal development of that city. The construction of the new bridge across the Thames River at New London, Conn., for the New York, New Haven, and Hartford had not progressed beyond the foundations, a work of great difficulty that was being carried on by open caissons, as the depth was beyond the limits of pneumatic working. The Bessemer and Lake Erie was building a new 2327-ft. viaduct and bridge over the Allegheny River at Black Run involving the use of 10,000 tons of steel.

**PROPOSED SAN FRANCISCO-OAKLAND BRIDGE.** During the year there was renewed discussion of a San Francisco-Oakland Bridge and public hearings were held by a United States Army Board of Engineers on August 15th and 17th, at which three important sets of plans were presented and considered for a report to the War Department. These projects, while not entirely new, were of interest as indicating modern practice in bridge construction. According to the *Engineering Record* of September 30th and August 26th, they were in outline as follows:

1. By the associated bridge engineers, Wilbur J. Watson & Co., Cleveland; William R. Davis, Albany, N. Y., and Harlan D. Miller, Albany, N. Y., and Oakland, Cal. A bridge to extend from First and Adeline Streets, Oakland, to Second and Townsend Streets, San Francisco. It was to have 200- and 250-ft. steel spans, with clearances of from 20 to 90 feet, including one bascule or lift span with 200-ft. waterway. The estimated cost, \$23,900,000, was to be met

by bonding a bridge assessment district made up of San Francisco, Oakland, Alameda, Berkeley, and adjacent towns. The estimated revenue from the traffic on the bridge would pay for its construction in about 25 years.

2. By Charles Evan Fowler, in association with Gustav Lindenthal, Frank C. Osborn, Edwin Duryea, Jr., and Prof. Charles B. Weing, of Seattle. Bridge of cantilever type, with three 2000-ft. spans, 150 feet high, between Telegraph Hill, San Francisco, and Goat Island, then from Goat Island to Oakland, with 2950 feet of approach, including an 800-ft. cantilever span. The estimated cost was \$75,000,000, which would be raised by the formation of a private corporation to build the bridge and take over the transbay transportation systems and charge a 5-cent rate for street car and bridge.

3. By Alan C. Rush, of Los Angeles. Suspension bridge from Alameda shore to Rincon Hill, San Francisco. It was to be 180 feet high, with spans of 2000 feet. The estimated cost was \$32,000,000. It was proposed that Oakland and San Francisco should donate terminals and secure two-thirds of the bridge stock.

4. A fourth plan, by Col. Robert A. Lee Van Folkenberg, for a pontoon bridge to cost \$19,000,000 was presented at the final hearing on August 17th.

Opinion was not unanimous for a bridge as a tunnel was advocated by Taggart Aston, modeled after the Detroit tunnel, to cost \$15,000,000 for one double tube. Charles F. Reuter offered plans for tubes and terminals at an outlay of \$33,000,000; Jerome Newman filed a plan for a trench type of tunnel; and John G. Little proposed a low bridge or roadway for the greater part of the distance across the bay, leaving open only a 2000-ft. channel, which could be traversed through a tube.

**QUEBEC BRIDGE ACCIDENT.** The second serious disaster attending the construction of this great bridge with its record cantilever span of 1800 feet occurred on Sept. 11, 1916, at 10.50 A. M., while the centre suspended span completing the structure was being hoisted into place. This suspended span of nickel steel 640 feet long and 88 feet wide and weighing some 5000 tons, broke from its suspending stirrups by which it was being hoisted, crumpled up, and slid into the stream, involving the loss of 11 workmen in addition to those injured. The first disaster to the new Quebec Bridge, Aug. 29, 1907 (see YEAR BOOK for 1907), in which some 74 lives were lost, led to the improved design and reconstruction of the bridge. The completion of the cantilever arms on either side had been effected and the final work remained of placing the central or suspended span connecting them. This span had been assembled and erected at Sillery on staging over the shallow waters of Victoria Cove, about three miles down the river from the bridge site. It was then floated from the timbers on six scows and towed to the permanent location by tugs. The task was to hoist the span to its position, a vertical distance of 145 feet, by means of suspended lifting chains and girders under each corner of the span. The lifting was done by hydraulic lifting jacks installed on the cantilever arms, and each operation involved a lift of about two feet and required approximately 15 minutes. Accord-

ingly there would have been required some 73 successive lifting operations which would have consumed about 20 hours.

The raising of the span was made an important occasion, many visiting engineers being present, but fortunately only the workmen concerned were admitted to the span itself and but few to the cantilever arms. The suspended span had been brought into position successfully and had been hung to the cantilever arms by the hanger chains and attached to the mooring truss. By the action of the tide and the lifting jacks the span had been raised free of the barges, which were then removed. The hoisting chains connected in pairs to lifting girders on which the span rested accordingly carried the load for over an hour, in the course of which it was raised some 10 or 15 feet. Then occurred the disaster. The southwest corner of the suspended span slipped out of its supporting stirrup, the trusses crumpled, and the entire structure, working free, slid from its supports into the river, where it sank.

Thus occurred the second catastrophe in the erection of the world's greatest bridge where more than ever before care had been spent on the design and erection, and on the test of the materials used. Indeed it came as a shock to engineers and for that reason the critical analyses and study of the disaster received detailed attention in the engineering journals. There was no criticism of the method, or its execution, and the strength of the cantilever arms under the shock was demonstrated. But it was shown that sufficient attention had not been paid to the cast steel rocker bearing interposed between the bottom of the southwest corner of the span and the lifting girder upon which it rested and to which the hoisting chains were attached. Here a fracture and breaking down occurred, the lifting girder kicked back from its position, and this corner being released developed stresses beyond the resistance of the trusses making up the span, leading to its failure and breaking free from all supports. This rocker bearing was mounted on top of the lifting girder which carried a steel shoe casting with a longitudinal pin groove, carrying a pin  $9\frac{1}{2}$  inches in diameter and  $46\frac{1}{2}$  inches in length. On this pin rested the steel rocker casting which broke and this carried in turn a short transverse pin  $26\frac{3}{4}$  inches in length and 8 inches in diameter. Attached to the end post of the span and resting on this pin was the upper shoe. This arrangement made possible compensating for any unevenness or movement in the hoisting and had served during the support of the span at its point of original erection and on the scows.

The accident naturally gave rise to elaborate investigation of its cause and it was determined that the rocker casting that failed was too weak for its service by its very design, as indeed were the other three, one of which had to carry nearly twice the normal load. The stress was higher than would be considered safe for other parts of the structure where more dependable materials were used. Arrangements were made immediately after the disaster for the reconstruction of the span without essential modifications in design and material. For full discussion of the accident see *Engineering News*, particularly issues for September 21st and October 5th.

**DESTRUCTION OF CERNAVODA BRIDGE.** The record of the year includes destruction as well as construction, and perhaps the most notable bridge to suffer was the great cantilever bridge across the Danube at Cernavoda, Rumania. This bridge, stated to be the longest span cantilever bridge in continental Europe, was wrecked by the Rumanian army in its retreat on October 26th (see WAR OF THE NATIONS). The structure was of extraordinary length—the iron work 13,460 feet—and comprised the Cernavoda bridge proper, 2460 feet; the approaches to Cernavoda bridge, 3000 feet; the viaduct on Balta island, 4770 feet; Borcea bridge, 1380 feet; and approaches to the Borcea bridge, 1840 feet. The bridge was  $5\frac{1}{2}$  years in construction and was completed in 1896.

The exigencies of war, however, require construction as well as demolition and an event of the year was the rebuilding of the great Poniatowski Bridge across the Vistula at Warsaw by the Germans. This bridge had been destroyed by the Russians when they evacuated the city in August, 1915.

A notable addition to bridge literature was the publication during the year of a two-volume treatise on *Bridge Engineering* by Dr. J. A. L. Waddell (New York). This work has a valuable summary of the evolution of bridge engineering as well as many discussions of modern practice and theory.

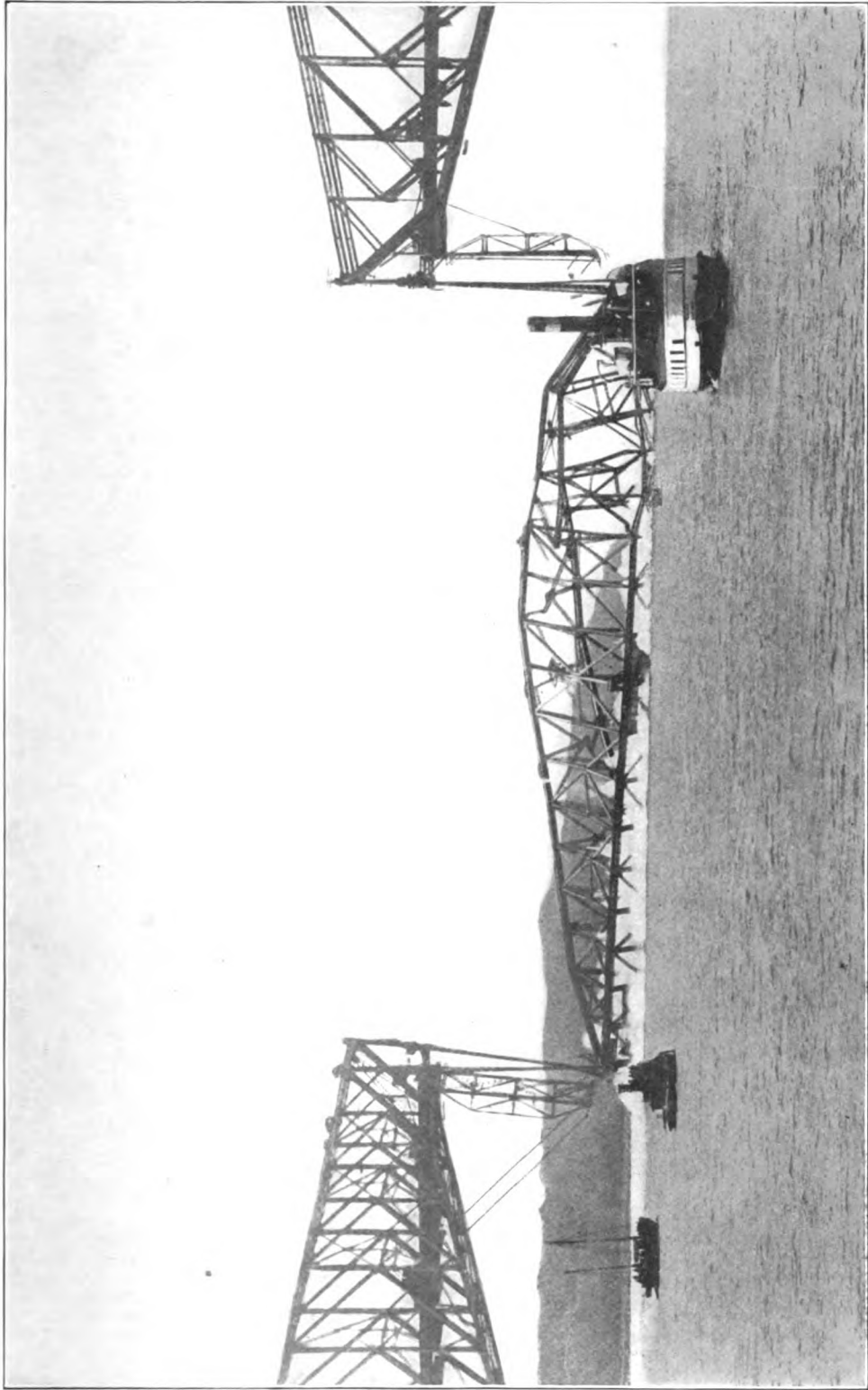
**BRITISH ASSOCIATION.** See ADVANCEMENT OF SCIENCE, BRITISH ASSOCIATION FOR THE

**BRITISH COLUMBIA.** A province of the Dominion of Canada, extending from Alberta west to the Pacific Ocean and Alaska. The capital is Victoria. Area, 355,855 square miles, of which 2439 water. Between 1901 and 1911 the population increased 119.68 per cent, or 178,857 to 392,480. The city of Vancouver had in 1911 100,401 inhabitants, being the fourth city in size in Canada; Victoria, 31,660; New Westminster, 13,199; Nanaimo, 8306; Nelson, 4476; Prince Rupert (now western terminus of the Grand Trunk Pacific Railway), 4184. Of the population 10 years of age and over in 1911, males numbered 218,646 (66.82 per cent) and females 108,547 (33.18); of these, 189,482 males and 16,627 females were reported as employed in gainful occupations. Of the males employed 16.7 per cent were credited to agriculture, 15.4 transportation, 12.7 agriculture, 12.7 building trades, and 10.9 trade and merchandising; of the females, 42 per cent were in domestic and personal service, 19.6 in manufacturing, 19.5 professional, and 12.2 in trade and merchandising.

The provincial government is administered by a lieutenant-governor, appointed by the Governor-General of the Dominion; he acts through an executive council, or responsible ministry of seven members. The legislative assembly consists of one chamber of 42 members elected by direct vote for four years. In the 12th Parliament, which convened in 1911, British Columbia was represented by three senators and seven members of the House of Commons; the representation on the basis of the 1911 census is 13. Lieutenant-Governor in 1916, Frank Stillman Barnard, appointed to succeed Thomas W. Paterson, Dec. 5, 1914. Premier in 1916, H. C. Brewster. See AGRICULTURE.

**BRITISH EAST AFRICA.** A term sometimes applied to the East Africa Protectorate,





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**COLLAPSE OF THE CENTRE SPAN OF THE QUEBEC BRIDGE, SEPTEMBER 11, 1916**



Uganda, and Zanzibar, regarded collectively. See the articles on these subjects.

**BRITISH GUIANA.** A British colony on the northeast coast of South America. Area, 90,277 square miles; population, 296,041 (153,717 males, 142,324 females). The unenumerated aborigines in the unfrequented parts of the country are estimated at about 10,000. Population (1911) of Georgetown, the capital, 54,318. Sugar production is now the chief industry. There are 43 sugar plantations, with a combined area of 162,139 acres (72,527 under sugar cane, 6448 under plantains, etc., and the remainder pasture or uncultivated). Rice is grown in the lowlands on about 42,000 acres. Balata, timber, and charcoal are also exported. Gold and diamond digging is carried on. About half the trade is with the United Kingdom and a third with the United States. Railways are as follows: Georgetown to Rosaigol, 60½ miles; Vreeden Hoop to Greenwich Park, 15; branch to gold diggings, 18¾. There are telegraph, telephone, and cable systems. In the following table the commercial statistics are for calendar years, financial figures are for fiscal years:

	1910-11	1911-12	1912-13	1913-14
	£	£	£	£
Imports . . . . .	1,749,766	1,703,855	1,694,155	1,766,094
Exports . . . . .	1,820,198	1,798,597	2,193,120	2,623,064
Revenue . . . . .	563,100	580,446	608,683	586,598
Expenditure . . . . .	542,757	590,745	592,532	622,025
Shipping * . . . . .	1,006,199	921,885	1,039,582	.....

\* Tonnage entered and cleared.

Customs revenue (1914-15), £333,474. Public debt, March 31, 1915, £882,115.

**BRITISH HONDURAS.** A British colony on the east coast of Central America. Area, 8508 square miles; population (1911 census), 40,510; estimate of April 2, 1914, 41,543. Belixe, the capital, has (1911) 10,478 inhabitants. Wood-cutting is the main occupation of the people. In the following table commercial figures are for calendar years, financial figures are for fiscal years:

	1911-12	1912-13	1913-14	1914-15
	£	£	£	£
Imports . . . . .	2,886,677	2,496,908	2,185,368	2,980,406
Exports . . . . .	2,685,849	2,856,043	3,126,225	2,918,775
Revenue . . . . .	1,201,908	575,243	590,982	513,149
Expenditure . . . . .	532,123	611,131	609,441	596,979
Shipping * . . . . .	588,867	630,064	816,858	923,979

\* Tonnage entered and cleared.

A short railway leads 25 miles inland from the town of Stann Creek (2640 inhabitants).

**BRITISH INDIA.** See INDIA, BRITISH.

**BRITISH NEW GUINEA.** See PAPUA.

**BRITISH NORTH BORNEO.** The northern part of the island of Borneo, forming together with adjacent islands a British protectorate, under the jurisdiction of the British North Borneo Company. Area, 31,000 square miles. Population, about 208,000. The Straits Settlements dollar (worth \$0.56776) is now the standard coin. Completed railway, 130 miles. The company administers the country through a resident governor.

**BRITISH SOMALILAND.** See SOMALILAND PROTECTORATE.

**BRITISH SOUTH AFRICA.** See SOUTH AFRICA, UNION OF.

**BRITISH WEST AFRICA.** A collective name for the following British colonies and protectorates in western Africa: Nigeria, including colony and protectorate; Gold Coast, including Ashanti and the Northern Territories; Sierra Leone, including colony and protectorate; and Gambia, including colony and protectorate. See these separate titles.

**BROMINE.** See CHEMISTRY, INDUSTRIAL.

**BROOKE, STOFFORD AUGUSTUS.** A British clergyman and literary critic, died at Ewhurst, Surrey, March 18, 1916. He was born in 1832 at Letterkenny, County Donegal, Ireland, and after graduating with high honor at Trinity College, Dublin, was ordained a clergyman in the Church of England in 1857. In London he was minister of St. James's Chapel, York Street, for nine years (1866-75) and of Bedford Chapel from 1876 to 1894. While he held the latter charge, a change in theological views, which had been becoming gradually more marked in his sermons, led him to secede from the Established Church, and after 1880 he was known nominally as a Unitarian. For a time Dr. Brooke served as honorary chaplain to Queen Victoria, and was known as an eloquent preacher. But he will be remembered chiefly for his scholarly writings on the English poets, although he wrote in prose on other subjects and also in verse. Dr. Brooke was instrumental in having Dove Cottage purchased as a memorial to Wordsworth. He published, besides volumes of sermons and other works: *Life and Letters of the Late Frederick W. Robertson* (1865); *Theology in the English Poets* (1874); *Primer of English Literature* (1876); *History of Early English Literature* (1892), an important contribution; *Poetry of Robert Browning* (1902), one of the best criticisms of this poet; *Studies in Poetry* (1907); *Four Poets* (1908), treating of Clough, Arnold, Morris, and Rossetti. Dr. Brooke was to a large extent in sympathy with the literary, artistic, and social ideas of John Ruskin.

**BROOKLYN INSTITUTE OF ARTS AND SCIENCES.** An institution founded in 1824 and reincorporated in 1890. It consists of three departments, a department of education, the Brooklyn Museum (see PAINTING AND SCULPTURE), and Brooklyn Botanic Garden. The department of education, now in its twenty-eighth year, offers addresses, lectures, courses of instruction, concerts, and meetings, and maintains a biological laboratory. Nominal fees are required as payment for the privileges. One important feature of the educational system of the Institute is a school of pedagogy. Many important men are secured as speakers and the best artists provide the concerts. The Brooklyn Museum (of which William Henry Fox is director) is famous for its collections in three departments—art, ethnology, and natural science. The Botanic Garden, of which Dr. C. Stuart Gager is director, is also noted. Supplementing the work of the Institute, which is intended essentially for adults, is a children's museum and library. The total number of persons who took advantage of the varied departments of the Institute was 1,093,809 in 1915-16, as compared with 6900 in 1887-88. For the same years the receipts were respectively \$417,434.89 and \$4456.70 and the permanent funds \$785,773.18 and \$37,000. There are branches of the Institute at Jamaica and Huntington, Long Island.

President of the Board of Trustees, A. Augustus Healy.

**BROUGH, CHARLES H.** Elected Democratic Governor of Arkansas, Nov. 7, 1916.

**BROWN, FRANCIS.** An American theologian and educator, died in New York City, Oct. 15, 1916. He was born at Hanover, N. H., in 1849, graduated at Phillips Andover Academy, took the degree of A.B. at Dartmouth in 1870 and that of A.M. in 1873, and completed the course at Union Theological Seminary in 1877. After two years of further study at Berlin, he returned to be instructor in biblical philology at Union Seminary, with which institution he was thereafter connected till his death, becoming Davenport professor of Hebrew and cognate languages in 1890, and, in addition, president of the faculty in 1908. During 1907-08 Dr. Brown served as director of the American School of Oriental Study and Research in Palestine. In 1911, with Prof. William Adams Brown, also of Union Seminary, he was tried for heresy before the Presbyterian General Assembly, in session at Atlantic City. Rev. W. L. McEwan of Pittsburgh charged Dr. Francis Brown with the publication of statements in the *New York Observer* contrary to cherished Presbyterian and evangelical doctrines. Both theologians were exonerated. Dr. Brown held membership in various biblical, archaeological, and educational associations. He had received honorary degrees from Hamilton, Dartmouth, Yale, Williams, and Harvard, and from Glasgow and Oxford. His scholarly work includes: *Assyriology: Its Use and Abuse in Old Testament Study* (1885); *Hebrew and English Lexicon of the Old Testament* (1891-1906), with C. A. Briggs and S. R. Driver; *The Christian Point of View* (1902), with A. C. McGiffert and G. W. Knox.

**BROWNLOW, SIR CHARLES.** A British soldier, died at Bracknell, Berkshire, April 5, 1916. Born in 1831, at 16 he entered the Indian army as ensign and before he was 22 had served in the Punjab campaign which broke the power of the Sikhs and had won a medal at Hazara. After expeditions against various Indian tribes, and having taken command of the eighth regiment of Punjab infantry, which he raised, he was with the China Expeditionary Force at the occupation of Peking. For his services during the Lushai Expedition of 1871-72, he was made a K.C.B. and he was aide-de-camp to Queen Victoria for 12 years. Brownlow held the rank of brigadier-general during five years in Bengal, and was Assistant Military Secretary at the War Office, London, from 1879 to 1889. Meanwhile he had been promoted G.C.B., and on his retirement became general. A field marshal from 1908, he was at his death the oldest British soldier of that rank.

**BROWN UNIVERSITY.** A non-sectarian educational institution at Providence, R. I. It was founded in 1764. Among its departments is a Woman's College. The total enrollment in the fall of 1916 was 1134, and the faculty numbered 72. During the year Dr. Camillo von Klenze, head of the department of German, resigned and went to the College of the City of New York. There were no noteworthy benefactions to the university. The productive funds amounted to \$4,581,911 in 1916. The library contains 235,000 volumes. President, William H. P. Faunce.

**BRUNTON, SIR (THOMAS) LAUDER.** A British pharmacologist and physiologist, died in London Sept. 16, 1916. He was born at Hiltenshill, Roxburghshire, in 1844, and took the degrees of M.D. and D.Sc. at Edinburgh. Subsequently both Edinburgh and Aberdeen gave him the honorary LL.D. His medical studies included work in Paris, Berlin, Vienna, and Leipzig under the greatest physiologists of the day. By 1870 he had become a member of the Royal College of Surgeons of London, and by 1876 a fellow. For many years Brunton served as consulting physician to St. Bartholomew's Hospital. By his writings he gained a reputation as the leading authority on pharmacology and therapeutics in Great Britain. His *Experimental Investigation of the Actions of Medicine* (1875) is regarded as the first systematic textbook on experimental pharmacology, and his *Pharmacology, Therapeutics, and Materia Medica* (1885) as the first complete treatise on the subject from the viewpoint of the physiologist. The latter work appeared in English and American editions, and was translated into French, Italian, Spanish, and German. Brunton's Croonian Lectures of the Royal College of Physicians, delivered in 1889, and entitled "Relationship between Chemical Structure and Physiological Action" were the first to treat this subject. Among various contributions to medical science may be mentioned his introduction of the drugs which lower blood tension. He was knighted in 1900 and made a baronet in 1908, and in 1906 was vice-president of the Royal Society. Besides the books mentioned, he wrote: *The Bible and Science* (1881); *Circulation and Respiration* (2 series, 1907, 1916); and *Therapeutics of the Circulation* (1908).

**BRUSILOV, ALEXEI A.** See WAR OF THE NATIONS.

**BRYAN, WILLIAM JENNINGS.** See NEBRASKA; UNITED STATES, *Presidential Campaign*; UNITED STATES AND THE WAR.

**BRYN MAWR COLLEGE.** A non-sectarian institution for the education of women, at Bryn Mawr, Pa. It was founded in 1885. In November, 1916, there were 449 students in all departments, and the faculty and teaching staff numbered 67. Dean Marion Reilly resigned and was succeeded by Dr. Eunice Morgan Schenck. The most noteworthy benefaction of the year was a bequest of \$158,782 made by Elizabeth S. Shippen of Philadelphia. An anonymous donor gave the college \$15,000 to found a research fellowship and a new scholarship was provided for by a \$5000 bequest of Mr. George W. Kendrick. In the spring much publicity was given to criticisms by certain of the faculty members and former faculty members charging autocratic control of the affairs of the college by the president. At the time a reorganization looking to a more democratic system was in course of preparation. In 1916 the productive funds of the college amounted to \$2,185,135 and the income to \$387,664. The library contains 81,368 volumes. President, Miss M. Carey Thomas. See UNIVERSITIES AND COLLEGES.

**BUCKWHEAT.** The United States, almost the only country publishing regularly since the outbreak of the European war the annual acreage and production of buckwheat, according to estimates by the Department of Agriculture had a total yield in 1916 of 11,840,000 bushels from 845,000 acres as compared with a yield of

15,056,000 bushels from 769,000 acres in 1915. The average yield per acre for the two years was 14 and 19.6 bushels respectively and that for the five years 1910-14 was 20.6 bushels. The average price paid farmers on Dec. 1, 1916, was 112.9 cents or 34.2 cents more than on the same date the preceding year, and on this basis the total value of the 1916 crop was \$13,364,000 as compared with \$11,843,000 the year before and the highest recorded since 1868. Largely due to the shortage in the crop the price went higher than in years, and in November, 1916, good milling buckwheat sold in eastern producing centres for from \$2.50 to \$3.00 per 100 pounds, the legal weight per bushel being generally 48 pounds. Pennsylvania and New York continued to be the principal producing States.

Buckwheat in the United States is increasing in popularity as an orchard cover crop. It makes a rapid growth in the fall, mats down readily, making a cover protecting the ground, checks late growth in orchards, and can be plowed under early in spring. The Pennsylvania Experiment Station found it to be one of the best non-leguminous crops for this purpose and especially useful on soil recently cleared, where it tends to keep down the second growth of sprouts and underbrush.

**BUFFALO.** See EDUCATION IN THE UNITED STATES.

**BUHLIG, RICHARD.** See MUSIC, Artists, Instrumentalists.

**BUILDING OPERATIONS.** The general prosperity of the United States in 1916 was reflected in the large amount of building, both public and private, that was taking place. Reports from the building departments of the larger cities indicated great building activity throughout the year, every month except August and September showing a distinct improvement over 1915 and the aggregate for the year of 85 of the most important cities an increase of no less than 19.4 per cent. The figures by months as compiled by *Dun's Review* were as follows:

	1916	1915
December, 82 cities .....	\$58,827,827	\$57,679,278
November, 90 cities .....	62,581,756	58,111,878
October, 86 cities .....	72,532,350	60,151,479
September, 90 cities .....	58,380,188	61,028,645
August, 89 cities .....	60,758,321	63,867,428
July, 87 cities .....	103,016,666	59,597,079
June, 86 cities .....	72,408,488	57,738,981
May, 84 cities .....	100,149,728	74,373,076
April, 83 cities .....	76,927,860	66,980,612
March, 85 cities .....	72,933,633	63,390,427
February, 82 cities .....	47,580,578	40,105,569
January, 81 cities .....	46,378,478	34,013,692
Totals for years .....	\$882,425,818	\$696,977,139

The same general trend for the year is shown in a somewhat similar compilation of contracts in the engineering and building line for both public and private work actually awarded, published by F. W. Dodge Co., and covering the States of New England, New York, New Jersey, Pennsylvania, Maryland, and Delaware, District of Columbia, Virginia, Ohio, West Virginia, Illinois, Indiana, Iowa, Wisconsin, Michigan, North and South Dakota, and portions of Missouri and eastern Kansas. Comparative figures for several years were as follows:

Contracts awarded for the year 1916 ... \$1,356,989,897  
 Contracts awarded for the year 1915 ... 940,089,334

Contracts awarded for the year 1914 .....	720,241,800
Contracts awarded for the year 1913 .....	857,693,500
Contracts awarded for the year 1912 .....	868,108,000
Contracts awarded for the year 1911 .....	777,456,818
Contracts awarded for the year 1910 .....	805,700,899

The statistics for the States of New York and New Jersey were as follows:

Contracts awarded for the year 1916 .....	\$283,659,500
Contracts awarded for the year 1915 .....	169,794,734
Contracts awarded for the year 1914 .....	129,204,500
Contracts awarded for the year 1913 .....	261,007,500
Contracts awarded for the year 1912 .....	232,167,000
Contracts awarded for the year 1911 .....	227,912,500
Contracts awarded for the year 1910 .....	254,819,000

**BUILDING IN NEW YORK CITY.** In New York there were filed with the Bureau of Buildings in the year 1916 plans and specifications for 564 buildings to cost \$114,690,145, as compared with 489 new buildings to cost \$64,652,869 in 1915. This was an increase for the year of \$50,000,000, or 73 per cent. For the same period there was an advance in the number of plans for alterations from 3237 to cost \$9,019,806, to 3884 to cost \$19,387,899. This was a gain of \$10,000,000, or about 110 per cent for the year.

A comparison of the number and value of the plans for new buildings by months is of interest as it shows that the plans filed reached their greatest valuation in the month of July, when the aggregate amount was \$45,472,000. This was a natural result of the restriction of buildings to certain areas depending upon their use, size, and construction in pursuance of a zoning and districting plan adopted by the city authorities which went into effect in August. (See CITY PLANNING, *New York Zoning Regulations*.) Plans filed in July, 1916, exceeded the total for any month in either 1916 or 1915, the next largest month being May, 1916, with \$16,963,000, when the same influences were at work. The sum for June, 1916, was \$16,126,000. The figures for the month of December alone were 34 buildings to cost \$4,022,000, as compared with 29 buildings to cost \$3,601,000 in December of the year before.

The largest month in 1915 was May, with a total of 38 buildings to cost \$13,566,000. This included, however, the plan for the \$10,000,000 County Court House.

The accompanying tables for the city of New York show a comparison of the number of new buildings and the estimated cost for the year 1916 and also 1915:

Month	1915		1916	
	No. of Bldgs.	Estimated Cost	No. of Bldgs.	Estimated Cost
January ..	27	\$7,880,100	32	\$4,588,950
February ..	40	4,982,900	15	2,393,845
March .....	47	4,134,025	56	5,262,800
April .....	69	5,834,740	61	7,028,700
May .....	38	13,566,625	65	16,963,600
June .....	37	3,290,880	75	16,126,500
July .....	50	4,097,080	101	45,472,250
August .....	43	7,260,500	39	3,151,500
September ..	28	3,739,850	26	2,271,000
October .....	42	2,420,750	44	6,009,800
November ..	39	3,894,400	16	1,398,850
December ..	29	3,601,569	34	4,022,850
Total ..	489	\$64,652,869	564	\$114,690,145

In the case of new buildings the classification of their use and their estimated cost for the entire year 1916 was as follows:

Classification—	No. of Bldgs.	Estimated Cost
Dwelling houses—		
Estimated cost over \$50,000.....	80	\$2,869,000
Estimated cost between \$20,000 and \$50,000 .....	5	185,000
Estimated cost under \$20,000...	8	11,700
Tenements .....	183	87,841,500
Hotels .....	27	26,717,000
Stores, lofts, etc.—		
Estimated cost over \$30,000....	45	17,817,650
Estimated cost between \$15,000 and \$30,000 .....	5	107,000
Estimated cost under \$15,000...	16	106,000
Office buildings .....	43	12,651,500
Manufactories and work shops....	35	6,167,600
School houses .....	3	795,000
Churches .....	10	858,500
Public buildings—		
Municipal .....	9	969,000
Places of amusement, etc.....	30	3,639,500
Hospitals .....	2	1,000,000
Stables and garages .....	87	2,910,100
Other structures .....	31	44,095
<b>Total .....</b>	<b>564</b>	<b>\$114,690,145</b>

See ARCHITECTURE; CITY PLANNING; CONCRETE.

**BUKOWINA.** An Austrian crownland south of Eastern Galicia, bounded by Russia and Rumania on the east and Rumania on the south. Area, 4031 square miles. Population at the census of Dec. 31, 1910, 800,098, compared with 730,195 in 1900. The natural increase in the decade was 104,857 and the net emigration 34,954. Of the inhabitants in 1910, 547,944 (68.49 per cent) were returned as adherents of the Orthodox Church; Catholics (including those of the Roman, Greek, and Armenian rites), 125,404 (15.67 per cent); Jews, 102,919 (12.86 per cent); Evangelicals, 20,513 (2.56 per cent). The number of Austrian subjects in 1910 was 794,929; Ruthenian was the vernacular of 305,101 (38.38 per cent) of these; Rumanian, 273,254 (34.38 per cent), which includes almost all Rumanian-speaking Austrians; German, 168,851 (21.24 per cent); Polish, 36,210 (4.55 per cent); Hungarian, 10,391 (1.31 per cent), which includes almost all Austrians of Hungarian vernacular. Of the population in 1910, those dependent on agriculture constituted about 71.1 per cent; industry and the trades, 10.4 per cent; commerce and transportation, 9.4 per cent; public and military service, 9.0 per cent. The capital of the Bukowina is Czernowitz, on the right bank of the Pruth, which has developed into an important city largely within the last 40 years; it is the seat of one of the eight Austrian universities; its notably mixed population numbered 87,113 at the 1910 census. Other towns of some importance are Radautz, with 16,640 inhabitants in 1910; Suczawa, 11,401; Storozynetz, 10,353. See WAR OF THE NATIONS.

**BULGARIA.** One of the Balkan States; a constitutional monarchy of Europe; formerly a principality under the suzerainty of Turkey. An ally of the Central Powers in the War of the Nations. Capital, Sofia.

**AREA AND POPULATION.** Area and population previous to the Balkan wars are shown below:

	Area sq. km.	Sq. m.	Pop. 1910
Bulgaria, Northern.....	63,751.1	24,614	3,095,785
Eastern Rumelia .....	32,594.4	12,585	1,241,778
<b>Total Bulgaria.....</b>	<b>96,345.5</b>	<b>37,199</b>	<b>4,337,513</b>

Area acquired from Turkey (1913) is stated at 25,257 square kilometers, with an estimated population of 656,535; area ceded to Rumania, 7525 square kilometers, with 282,131 inhabitants. Total area, 114,017 square kilometers, with a population of 4,711,917.

Of the total population in 1910, 3,497,794 were Bulgarians, 466,117 Turks, 121,435 Tziganes, 79,787 Rumanians, 43,272 Greeks, 40,118 Jews, 21,145 Pomacs, 18,050 Tatars, 12,914 Armenians, etc. Belonging to the Orthodox Church were 3,643,951; 602,101 were Mohammedans, 40,070 Jews, 32,130 Catholics, 12,270 Armenian-Gregorians, 6262 Protestants, and 739 were of other persuasions. The capital, Sofia, had, in 1910, 102,312 inhabitants; Varna, 47,981; Ruschuk, 36,255; Slivno, 25,142; Shumla, 22,225; Plevna, 23,049; Stara-Zagora, 22,003; Tyrnova, 12,649; Dubnitsa, 11,601; Philippopolis, the capital of Eastern Rumelia, 47,981. In the new territory, Gümüljina, 30,033; Xanthi, 18,200.

**PRODUCTION.** About five-sevenths of the population are engaged in agriculture of a comparatively primitive order. A fertile soil and a favorable climate do much to offset the backwardness of the methods employed. No later figures are available than those given in the preceding YEAR BOOK.

**COMMERCE AND COMMUNICATIONS.** By governmental decrees the export of corn was prohibited from Jan. 19, 1915, but permitted for the 1914 crop from July 14, 1915, and then again entirely prohibited on Nov. 16, 1915. The export of rye was prohibited from Nov. 6, 1914, but permitted for the 1914 crop from Aug. 30, 1915, then completely permitted, until on Oct. 20, 1915, it was again entirely prohibited. The export of barley was prohibited from Nov. 6, 1914, but permitted for the 1914 crop from Aug. 3, 1915, and again entirely prohibited from September 20, 1915, in respect to every description of barley. By governmental decree of Nov. 16, 1914, the export of wheat, rice, oats, and spelt was definitely prohibited.

Import and export values are shown in the table below in thousands of leva:

	1909	1910	1911	1912	1913
Imports .....	160,430	177,357	199,345	218,110	189,421
Exports .....	111,484	129,052	184,684	156,407	93,205

In the table below are shown principal articles of trade, with values for 1913, in thousands of leva:

Imports	1000 l.	Exports	1000 l.
Textiles, etc. ....	83,458	Cereals .....	54,891
Machinery, etc. ....	27,808	Perfumes .....	7,788
Col. Prods. ....	13,748	Col. Prods. ....	6,917
Metals .....	13,515	Animals Prods. ....	9,486
Skins, etc. ....	11,800	Animals .....	1,677
Oils, etc. ....	7,338	Leather goods....	4,113

Austria-Hungary furnished imports valued at 54,863 thousand francs and received exports valued at 14,412 thousand. Germany, 37,079 and 16,884; Russia, 31,671 and 581; Great Britain, 16,881 and 7950; France, 12,987 and 5085; Rumania, 8787 and 1191; Turkey, 6379 and 4228.

Railways in operation (1913), 2233 kilometers belonging to the state and 241 kilometers to private companies; under construction, 140 kilometers.

FINANCE. The unit of value is the lev, worth 10.3 cents. A table showing revenue and expenditure for three years in leva is given below:

	1911	1912	1913
Revenue . . . .	198,795,814	170,038,592	168,724,841
Expenditure . .	182,487,552	158,665,948	167,771,466

The 1915 budget estimated the revenue at 275,379,886 leva and the expenditure at 275,366,200. The debt stood, June 30, 1915, at 1,155,732,710 leva.

NAVY. The navy includes 6 first-class torpedo boats (*Smely, Hrabry, Derzky, Choumny, letiachty, and Strogly*), of 100 tons each; 1 cruiser (*Nadejda*), of 735; 2 yachts, 5 transports, 2 second-class torpedo boats of 20 tons each, and some other small craft.

GOVERNMENT. The treaty of Berlin (July 13, 1878) created Bulgaria an autonomous and tributary principality of the Turkish Empire. To it was added Eastern Rumelia in 1885. In 1908 Bulgaria became an independent monarchy. She joined the Central Powers in October, 1915; and on the 13th day of that month the machinations of Premier Radoslavoff and King Ferdinand reached their culmination in the decision to declare war on Serbia.

Ferdinand I, King of the Bulgarians, was born at Vienna, Feb. 26, 1861, son of Prince Augustus of Saxe-Coburg and Gotha. Prince Boris (born Jan. 30, 1894) is the eldest son by the King's first marriage, in 1893, to Princess Marie Louise of Parma. His second wife (Feb. 28, 1908) is Eleonore of Reuss Köstritz.

HISTORY. In his address to Parliament toward the end of 1915 King Ferdinand was reported as saying that the Bulgarian attacks on Serbia were due to the latter's "incurable obstinacy" in refusing to recognize Bulgaria's rights in Macedonia, and as referring to the repulse of British and French troops sent "against the tortured Bulgarian nation in order to maintain Serbian tyranny over it." The German influence in Bulgaria was said to have become firmly fixed during the year 1915, and on January 1st, it was reported from Allied sources that German officials completely controlled the entire administration. The Kaiser paid a visit to King Ferdinand at Nish, where a banquet was held January 18th, to celebrate the anniversary of the institution of the Order of the Black Eagle. Formal speeches of compliment and congratulation on the alliance of the two Powers were made. For Bulgaria's part in the war, see WAR OF THE NATIONS. Parliament had warmly supported the war policy from the first. On December 29th all parties in the Sabranje had united in voting the war credits amounting to \$100,000,000, and had voted \$6,000,000 for the support of soldiers' families. Little definite information as to internal conditions during the year was available. It was announced on March 21st, that the Premier of Bulgaria, M. Radoslavoff, had been attacked by a post office employee named Ivanoff in Sofia, but the assailant succeeded only in wounding the coachman and was subsequently disarmed and captured. The address of the Bulgarian Prime Minister, M. Radoslavoff, at the opening of the Sobranje in December, 1916, was noteworthy for its thoroughgoing presentation of the Bulgarian case. Following the example of the German Chancellor, he went into the origin of the war,

but especially discussed the relations with Rumania. These relations, said he, had always been friendly even after the hostile conduct of Rumania in 1913 and her seizure of the Dobrudja so late as 1915. When the hostilities against Serbia began, the Rumanian cabinet promptly pledged to the Bulgarian government her neutrality to the end of the war. Bulgaria had also received assurances from Athens or Berlin that King Constantine would disregard the treaty with Serbia. Assured of this neutrality the Bulgarians had attacked the Serbians in August, 1916. However, said M. Radoslavoff, the Bulgarian government had become convinced of the hostile designs of its neighbors. At the end of that month the Rumanian Minister gave new evidence of friendship for Bulgaria by circulating the rumor that his government, wishing to remain on good terms with Bulgaria, was willing to surrender the portion of Dobrudja annexed in 1913 in return for an engagement on the part of Bulgaria that she would maintain a pacific attitude if Rumania attacked Austria. This was a mere ruse for the purpose of gaining time, but it had some effect on Bulgarian opinion. Nevertheless, the Bulgarian government did not permit itself to be deceived and when the Rumanian Minister sought an audience with M. Radoslavoff, President of the Council, the latter refused to receive him. He, himself, had made similar overtures to all the Powers of the Entente the year before and each of them had evaded an answer. It would appear from this speech that Bulgaria had carefully followed the policy of allowing the Rumanians to think that she would remain neutral. This policy succeeded and Rumania, as well as the Powers of the Entente, cherished the illusion. M. Radoslavoff went on to say that the retreat from Monaatir was only temporary and that later they would not only regain this lost ground but push farther on. He concluded his discourse with the following threat: "The time has come when the Allied governments will be able to give their parliaments good news which will receive the approval of all their people." This was interpreted by the Entente press as hinting at some plan for the partition of the occupied territory. At the close of the year, the Bulgarian Prime Minister, replying to certain critics in regard to the conduct of the war, said, "I assure you that the essential part of the task of Bulgaria has been accomplished. To those who complain that our desires are excessive I reply that we are not fanatical, that we understand the aspirations of the Bulgarian people, and that the royal manifesto on the occasion of the declaration of war has told you what these aspirations are." To those who criticized the seizure of the Danube by Bulgarian troops, the Prime Minister said that it had been ordered by the high command because it was necessary to pursue and destroy the Rumanian army. As to criticism of the part played by Germany and Austria in the Bulgarian army, he said, "Every German and Austrian officer in Bulgaria is under the command of Bulgarian officers."

**BUREAU OF SOCIAL HYGIENE.** See SOCIAL HYGIENE, BUREAU OF.

**BURLEIGH, EDWIN CHICK.** An American legislator, died at Augusta, Me., June 16, 1916. He was born at Linneus, Me., in 1843, and was early a teacher and land surveyor, and later a

clerk in several State offices. From 1886 to 1888 he held the post of State Treasurer, having been elected as a Republican, and from 1889 to 1892 that of Governor. In 1896 he was a delegate at large to the national convention of his party. In the United States House of Representatives, he saw continuous service from 1897 to 1911, and in 1913 became a member of the Senate. His term would have expired March 3, 1919. From 1887 Senator Burleigh published the *Kennebec Journal*, but his political activity was almost without break, so that only during a few years did he devote his main attention to his paper.

**BURMA.** The largest and easternmost province of British India. Geographically Burma is Indo-Chinese rather than Indian. Area, 230,839 square miles. Population according to the 1911 census, 12,115,217; of these, 1,127,975 were recorded as urban and 10,987,242 rural. Buddhists numbered 10,384,579. The capital is Rangoon. See AGRICULTURAL EXPERIMENT STATIONS.

**BURNETT, HENRY LAWRENCE.** An American lawyer and soldier, died Jan. 4, 1916, in New York City. He was born at Youngstown, Ohio, in 1838, and was educated at Chester Academy and at the Ohio State National Law School, from which he graduated in 1859. After a short period of law practice, he was elected a captain of Ohio cavalry, and served in the Civil War, rising to be brevet major-general of volunteers. In 1863, as judge-advocate of the Department of Ohio, he was sent to Indiana to prosecute the Sons of Liberty, several of whom were convicted and executed. With others, in 1865, he had charge of the investigation into the assassination of President Lincoln. After the war, General Burnett practiced law in Cincinnati, and, from 1872, in New York, where he gained an important place. By appointment of President McKinley, in 1898, he became United States District Attorney for the Southern District of New York State.

**BURNHAM, EDWARD LEVY-LAWSON,** first Baron. An English newspaper owner and editor, died Jan. 9, 1916, in London. He was born of Jewish parents in 1833 in London, and was known as Edward Levy until 1875, when, in consideration of a deed of gift, he added his uncle's name. After graduating from the University College School in London, he entered his father's printing establishment, and took charge of what was then an insignificant paper, the *Daily Telegraph and Courier*. On this he wrote leading editorials, as well as supervised the management, and his vigorous and enthusiastic efforts soon resulted in enlarged circulation. This, the first paper to be reduced in price from twopence to a penny, at once attracted the attention of the middle classes, and its news and advertising policies were aimed toward keeping this clientele. For many years it was the largest London paper, in number of news columns; lavish expenditures were made for telegraph and cable tolls; and every newest device for increasing the efficiency of a great newspaper plant was installed. Charitable and other public causes found in the *Daily Telegraph* a ready champion, one of the most notable instances of this policy being the aid rendered the Lancashire cotton spinners at the time of the American Civil War. It was this paper also which sent Henry M. Stanley to

Africa. Edward Levy-Lawson was made a baronet in 1892, was raised to the peerage as Baron Burnham in 1903, and received the K.C.V.O. the next year. In 1886 he served as president of the Royal Institute of Journalists, and in 1913, on the occasion of his eightieth birthday, a remarkable tribute was paid to him by the leading journalists of the world. Although he turned over active supervision of the *Daily Telegraph* to his son in 1903, Lord Burnham remained in close touch with its policies.

**BURNQUIST, J. A. A.** Reflected Republican Governor of Minnesota, Nov. 7, 1916.

**BURRILL, THOMAS JONATHAN.** An American botanist and educator, died April 14, 1916, at Urbana, Ill. He was born at Pittsfield, Mass., in 1839. For three years after graduating from the Illinois State Normal University, he was superintendent of schools at Urbana (1865-68), and thereafter, till his retirement in 1912, was connected with the University of Illinois—as professor of botany and horticulture for 33 years and then for nine years as professor of botany alone. He was also vice-president of the university from 1879 to 1912 and at various times was dean of the college of science, dean of the general faculty, dean of the graduate school, and acting president. For 24 years he held the post of botanist of the United States Agricultural Experiment Station at Urbana. Dr. Burrill was a fellow or member of various scientific societies, was president of the American Microscopical Society in 1885-86, and at the time of his death was vice-president of the botanical section of the American Association for the Advancement of Science. His writings include some 200 articles in educational and botanical journals and reports.

**BURROUGHS, EDITH WOODMAN.** An American sculptor, died Jan. 6, 1916, in Flushing, Long Island. Born at Riverdale-on-Hudson, N. Y., in 1871, she studied in New York at the Art Students' League under Saint-Gaudens, and in Paris under Inglebert, and for two years in Luc Olivier Merson's school. In 1893 she married Bryson Burroughs, an artist who became curator of paintings in the Metropolitan Museum, New York. She exhibited at the Champs de Mars, Paris, and in the United States, became a member of the National Sculpture Society, and received the Shaw Memorial prize from the National Academy of Design, of which body she was elected an associate. Mrs. Burroughs became especially known for her marble busts and figures of children, distinctive in their grace and charm. Her attention was devoted also to decorative sculpture, two fountains designed by her being at the Panama-Pacific Exposition, San Francisco, "The Fountain of Youth" and "The Arabian Nights." A sculptured portrait of John LaFarge by Mrs. Burroughs is in the Metropolitan Museum, New York.

**BUTTER.** See DAIRYING.

**CABIN CREEK FLOOD.** See FLOODS.

**CABRERA É IBARS, JUAN BAUTISTA.** A Spanish prelate and hymnologist, Bishop of the Spanish Reformed Church, died May 18, 1916. He was born in 1837 at Benisa, Valencia. He was brought up as a Roman Catholic and for a time taught in Pietist schools. After he had been ordained deacon and presbyter, a change of faith necessitated his exile to Gibraltar. Some years later he was enabled to return and to open in Seville the first Protestant chapel in Spain



(1869). Afterward he had a chapel in Madrid. In 1890 he was elected Bishop of the new Spanish Reformed Church, and in 1894 was consecrated by three prelates of the Irish Church headed by Archbishop Lord Plunkett, the Primate of Ireland, who gives an interesting account of the event in his *Memoirs*. Bishop Cabrera wrote on theological and historical subjects and became known as the most important Spanish hymnologist of the century. From 1874 he edited the religious paper *La Luz*. His literary work was recognized by election to the Hispanic Society of America.

**CADORNA, LUIGI, COUNT.** See WAR OF THE NATIONS.

**CALAVERAS DAM.** See DAMS.

**CALDER, WILLIAM M.** Elected Republican United States Senator from New York, Nov. 7, 1916.

**CALHOUN, WILLIAM JAMES.** An American diplomat and capitalist, died in Chicago, Sept. 19, 1916. Born in Pittsburgh, Pa., in 1848, he practiced law in Danville, Ill., from 1875 to 1898, then removing to Chicago, where he gained a lucrative practice as head of the firm of Calhoun, Lyford, and Sheehan. Mr. Calhoun's first public service was as special commissioner to Cuba, on appointment of President McKinley. He reported the need for intervention. For the two following years he served on the Interstate Commerce Commission. By President Roosevelt he was sent down to Venezuela in 1905, charged with the duty of adjusting relations that had become involved because of the schemes of Castro. From 1909 to 1913 he held the post of Minister to China, which he received through President Taft. Shortly before he left, he criticized sharply the American policy toward China, as controlled by President Wilson. Mr. Calhoun acquired important corporate interests in the American Steel and Wire Company, the Federal Steel Company, the Corn Products Company, and the Baltimore and Ohio Railroad.

**CALIBAN BY THE YELLOW SANDS.** See DRAMA.

**CALIFORNIA. POPULATION.** The estimated population of the State in December, 1916, was 2,983,843. The population in 1910 was 2,377,549.

**AGRICULTURE.** The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn ..... 1916	64,000	2,048,000	\$2,540,000
..... 1915	64,000	2,624,000	2,309,000
Wheat .... 1916	350,000	5,600,000	8,512,000
..... 1915	440,000	7,040,000	6,888,000
Oats ..... 1916	200,000	6,500,000	4,680,000
..... 1915	211,000	6,963,000	3,482,000
Rice ..... 1916	67,800	4,543,000	8,544,000
..... 1915	84,000	2,268,000	2,041,000
Potatoes ... 1916	75,000	10,575,000	14,805,000
..... 1915	78,000	10,140,000	7,605,000
Hay ..... 1916	2,500,000	4,375,000	55,125,000
..... 1915	2,511,000	a 4,520,000	50,624,000
Cotton .... 1916	72,000	60,000	5,748,000
..... 1915	84,000	b 84,000	1,822,000
Rye ..... 1916	8,000	104,000	121,000
..... 1915	8,000	112,000	101,000
Barley .... 1916	1,190,000	83,320,000	81,654,000
..... 1915	1,860,000	89,440,000	24,458,000

a Tons. b Bales of 500 pounds each.

**MINERAL PRODUCTION.** Although there was a decrease in 1915 in the number of productive

mines in the State, the production of gold, silver, copper, lead, and zinc was \$6,553,199 more than in 1914. The production of gold in 1915 was 1,085,464 fine ounces valued at \$22,442,206, an increase of 86,533 fine ounces, valued at \$1,877,800. The deep mines of the State yielded 669,204 fine ounces of gold valued at \$13,833,679. The placer mines yielded 16,441 fine ounces valued at \$8,608,617. The silver production in 1915 was 1,678,756 fine ounces, valued at \$851,129, an increase of 206,897 ounces in quantity, and \$37,191 in value over 1914. The mined production of copper in 1915 was 40,751,625 pounds, valued at \$7,131,534, an increase of 10,243,933 pounds in quantity and \$3,074,011 in value of 1914. The lead produced in 1915 amounted to 4,579,245 pounds valued at \$215,225, compared with 4,251,923 pounds, valued at \$165,825 in 1914. The recoverable mined production of zinc in 1915 was 13,094,032 pounds, valued at \$1,623,660, compared with \$389,471 pounds, valued at \$19,863 in 1914, an increase of 12,704,561 pounds in quantity, and \$1,603,797 in value. This production is the largest ever made in the State.

In marked contrast to conditions in the last nine years the petroleum output for 1915 followed a decline. As a consequence of this decline, and of the remarkable increase of petroleum in Oklahoma, California was obliged to yield first rank among the oil producing States, which it had held since 1908. Although the decrease, 13,000,000 barrels, is greater than the combined output of petroleum of Pennsylvania, New York, and southwestern Ohio in 1915, it represents only a decline of 13 per cent below the quantity marketed in 1914. The decrease is due chiefly to the slight drilling activity in 1915, and does not indicate that the productive acres have been fully developed, or that the productive sands are becoming exhausted. The depressed condition of the market in crude oil during the year resulted in less development.

There was great activity in mining in the State in the first six months of 1916. Aside from gold, silver, copper, and lead there was, during the year, a heavy demand also for such mineral substances as chrome, tungsten, magnesite, manganese, antimony, etc., and a great many mines of this sort were opened. The copper mines were very active during the year, owing to the high price of metals. Gold mining continued at about the same pace as in 1915. A little less gold and silver were presented for the mint at San Francisco than in the previous year.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments..	7,659	10,057
Average number of wage earners .....	115,296	189,481
Capital invested .....	\$587,184,000	\$736,106,000
Wages .....	84,142,000	105,618,000
The value of materials used	325,288,000	447,474,000
The value of products ....	529,761,000	712,801,000

**TRANSPORTATION.** The total aggregate of track mileage operated in the State on June

30, 1916, was 11,963 miles. Of this 3071 miles were main line track owned by railroad companies; 6146 miles were operated under lease. The lines having the longest mileage were the Atchison, Topeka, and Sante Fé 2249, Southern Pacific, 6239, and the San Pedro, Los Angeles, and Salt Lake, 511.

**EDUCATION.** The school population of the State in 1916 was estimated by the State Superintendent of Education at about 600,000. The enrollment in that year was 544,590, divided as follows: Kindergarten 20,721, elementary 423,562, high schools 95,405, normal schools 4902. The average daily attendance in the kindergarten schools was 4154, in the elementary schools 340,943, and in high schools 58,881, or a total of 403,968. The men teachers numbered 2848, and the women teachers 15,012, a total of 17,860.

**FINANCE.** The latest statement of the financial condition of the State is for the biennial period 1912-14. During this period the cash receipts amounted to \$75,830,859, and the disbursements to \$66,530,156, leaving a balance at the end of the year of \$19,213,233.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include State prisons at San Quentin and Folsom, the Preston School of Industry, the Whittier State School, California School for Girls, State Hospitals at Stockton, Napa, Agnew, and Mendocino, the Southern California State Hospital, the New State Hospital, the Sonoma State Home, the Folsom State Hospital, and the Industrial School for Adult Blind. The total expenditure for these institutions is about \$2,500,000 annually.

**POLITICS AND GOVERNMENT.** The political events in California during the year were of such a nature as to make them of national importance and interest. As a result of the primary election held on August 29th Governor Johnson became a candidate for the United States Senate, defeating Willis H. Booth by the nomination. California prior to the split in the Republican party in 1912 had been counted one of the sure Republican States, and it was thought by the Republican leaders that the elements in 1916 had so reunited as to place it again safely in the Republican column. It was found difficult, however, to reconcile the two elements of the party, chiefly because of the hostility between Governor Johnson and the leaders of the regular Republican wing; and, as it proved, these difficulties could not be reconciled. The main history of the campaign belongs in the article **PRESIDENTIAL CAMPAIGN**, and there it will be found in more detail. The election of Governor Johnson to the Senate by an overwhelming plurality, and the defeat of Mr. Hughes by a scant plurality served to indicate that the electorate had cast aside party lines, and had voted as it had never done before at a presidential election. Mr. Johnson's tremendous vote was due in part to the hold he had maintained upon the admiration of the California voters during his six years as chief executive of the State. A number of reasons have been given by the politicians of the State and elsewhere for Mr. Hughes's defeat. In the main the consensus seemed to prevail that he did not win the Progressive vote on account of his identification during his visit to the State with the Republican leaders, who

kept him from having any intercourse whatever with Governor Johnson. Women voted for the first time in the State in the presidential campaign, and while the assertion that President Wilson had kept the country out of war may have influenced the women's vote to a certain extent, it may be said on the whole that it was divided in practically the same proportion as that of the men. The total vote at the presidential election was 1,045,858, out of a total registration of 1,314,446. The vote for presidential electors was as follows: Democratic 466,889, Republican 462,516, Socialist 42,898, Prohibition 27,713. The Democratic plurality was 3773. For United States Senator Hiram W. Johnson received 574,667 votes, George S. Patton, Democrat, 277,852, Walter T. Mills, Socialist, 49,341, and Morris Atwood, Prohibitionist, 38,797. Johnson's plurality was 296,815. The constitutional amendment providing for prohibition was defeated. Two amendments were voted. Amendment No. 1 for straight prohibition received the following vote: Yes, 463,639; No, 538,200. Amendment No. 2 for partial prohibition: Yes, 461,039; No, 505,783. The State voted \$15,000,000 in bonds for the completion of a State highway system. A special session of the legislature was held during the year for the consideration of special measures chiefly of local interest.

**OTHER EVENTS.** In the first week in January, Matthew Schmidt was convicted as an accomplice of the McNamara brothers in the blowing up of the Los Angeles *Times* Building in 1910. The destruction of this building resulted in the death of 21 employees. Schmidt fled after the crime, and was not found until February, 1915, when he was arrested in New York City. He was sent to prison for life for the crime of murder in the first degree.

A decision of the United States District Court sitting at Fresno, was of great importance in relation to the oil fields of the State. In 1909 President Taft withdrew from settlement certain lands in the Mariposa District of the State, in which at the time there were no settlers, and on which no oil had been discovered. Sometime afterwards several oil companies entered the field and took from it oil valued at many millions of dollars. The government endeavored to oust these companies and to secure an accounting of oil taking. The decision of the court noted above authorized the prosecution of six suits against more than 100 defendants for such an accounting. It is said that the decision in favor of the United States might mean an award of over \$5,000,000. Twenty similar suits are pending.

As a result of area added in the municipal elections held in June, Los Angeles is the largest municipal area in the United States. Westgate and Occidental, containing together about 50 square miles, were annexed, making the total area 337.92 square miles. The area of New York is 314.75 square miles. The rapid growth in area has resulted from the completion of the \$23,000,000 aqueduct, which brings pure mountain water 250 miles by a gravity system in sufficient quantity for a city of 2,000,000. The total population of Los Angeles is now said to be about 550,000.

On July 22nd, a preparedness parade was held in San Francisco in which over 50,000 persons took part. The parade was marred by

the explosion of an infernal machine set off in a crowd, which caused the death of six persons and the injury of at least 25. The bomb escaped attention because it was hidden in an ordinary suit case, and was exploded by clock work. It went off just as the First California Regiment of Spanish-American War veterans were passing, and injured several of the members of this regiment. The parade continued as though nothing had occurred. Most of the damage was done among the spectators. The only clew to the perpetrators of the act was the fact that on the previous day an anonymous communication was sent to the various newspapers, threatening "a little direct action" to demonstrate that "militarism cannot be forced upon us and our children without a violent protest."

As a result of the six days' storm, which began on January 14th, the dam of the San Diego water system burst on January 28th. This resulted in floods throughout the southern part of the State, which caused the death of about 65 persons, made 3000 persons homeless, and destroyed property to the value of about \$200,000,000. During the last days of the month whole towns were destroyed, and many lives lost in the country around Los Angeles. Floods in the San Luis Rey Valley caused the death of many persons, and the loss of much property. See FLOODS.

On March 27th Governor Johnson issued a proclamation excluding from intra-State business in California about 5500 corporations, including the Ford Automobile Company, for failure to pay the State franchise tax of 1915. The Ford Company, whose tax amounted to \$24,000, refused payment on the ground that the sum was excessive.

See AGRICULTURAL LEGISLATION; ANTHROPOLOGY.

**STATE OFFICERS.** Governor, Hiram W. Johnson; \* Lieutenant-Governor, William D. Stephens; Secretary of State, Frank C. Jordan; Treasurer, Friend William Richardson; Comptroller, John S. Chambers; Attorney-General, U. S. Webb; Superintendent of Public Instruction, Edward Hyatt; Commissioner of Insurance, J. E. Phelps—all Progressives except F. C. Jordan and Edward Hyatt, Republicans.

**JUDICIARY.** Supreme Court: Chief Justice, Frank M. Angellotti; Associate Justices, William P. Lawlor, Lucien Shaw, H. A. Melvin, F. W. Henshaw, M. C. Sloss, and William G. Lorigan; Clerk, B. Grant Taylor.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Republicans	22	66	88
Democrats	10	11	21
Progressives	7	1	8
Independents	1	2	3
Republican majority	4	52	56

**CALIFORNIA, UNIVERSITY OF.** A co-educational State institution at Berkeley, Cal. (with certain professional schools in San Francisco). It was founded in 1860. The students numbered 12,529 in the academic year 1915-16 and the faculty 503. In 1916 two noted members of the faculty died, Eugene Woldemar Hilgard, emeritus professor of agriculture, and George

\* Takes seat in United States Senate, March 5, 1917.

Holmes Howison, professor of philosophy. Five buildings, built from a State bond issue of about \$2,000,000, were nearing completion in December: Wheeler Hall, named for the president of the university (a classroom building), costing \$700,000; a new wing for the library, costing \$525,000; an agriculture building (Hilgard Hall), costing \$350,000; a wing for the chemical laboratory, costing \$220,000; and a unit for the power plant. The department of physiology was divided into two departments, one of physiology and one of biochemistry and pharmacology; new departments of preventive medicine and home economics were established; and a faculty committee on international relations was appointed. A French library (6000 volumes) and \$160,000 in gifts were received. On June 30th the library of the university contained about 332,900 volumes. The university possessed in productive funds \$5,532,605 and in available income \$3,394,902. President, Benjamin Ide Wheeler.

**CAMBODIA.** A French protectorate, forming part of French Indo-China. The capital is Pnom-Penh; its population, which is variously stated, is probably over 60,000. Most of the foreign trade passes through Saigon (Cochin-China). See FRENCH INDO-CHINA.

**CAMEROONS.** See KAMERUN.

**CAMPBELL, THOMAS E.** Elected Republican Governor of Arizona, Nov. 7, 1916.

**CAMPFOB, SYNTHETIC.** See CHEMISTRY, INDUSTRIAL.

**CANADA, DOMINION OF.** A British self-governing dependency north of the United States. The capital is Ottawa, in the Province of Ontario.

**AREA AND POPULATION.** The area of Canada is computed at 3,729,665 square miles. The population was estimated March 31, 1915, at 8,136,000. Area by provinces and territories, in square miles:

	Land	Water *	Total *
Alberta	252,925	2,360	255,385
British Columbia	358,416	2,439	355,855
Manitoba	231,928	19,906	251,832
New Brunswick	27,911	74	27,985
Nova Scotia	21,068	360	21,428
Ontario	365,880	41,882	407,262
Prince Edward Island	2,184		2,184
Quebec	690,865	15,969	706,834
Saskatchewan	243,382	8,318	251,700
Yukon Territory	206,427	649	207,076
Northwest Territories	1,207,926	84,298	1,242,224
Canada	3,603,910	125,755	3,729,665

\* The water area is exclusive of Hudson Bay, Ungava Bay, the Gulf of St. Lawrence, and all other tidal waters, excepting that portion of the River St. Lawrence which is between Pointe-des-Monts in Saguenay and the foot of Lake St. Peter.

The areas of Manitoba, Ontario, Quebec, and the Northwest Territories, as given in the foregoing table, have been adjusted to conform to the Boundary Extension Acts of 1912, whereby these three provinces were enlarged by annexations from the Northwest Territories. The table below shows the area by provinces and territories before the Boundary Extension Acts became operative, the population according to the censuses of April 1, 1901, and June 1, 1911, and the increase per cent of population between 1901 and 1911; also, in the last column, the population in 1871:

	Sq. mi.	Pop. '01	Pop. '11	Incr.	Pop. '17
Alta.	255,285	78,022	374,668	418.08	.....
B. C.	355,855	178,657	892,480	119.68	36,247
Man.	78,732	255,211	455,614	78.52	25,228
N. B.	27,985	331,120	351,889	6.27	285,594
N. S.	21,428	459,574	492,388	7.18	887,800
Ont.	260,862	2,182,947	2,528,274	15.58	1,620,851
Y. T.	207,076	27,219	8,512	*68.78	.....
P. E. I.	2,184	103,259	98,728	*9.23	84,021
P. Q.	851,873	1,648,898	2,008,282	21.49	1,191,516
Sask.	251,700	91,279	492,432	439.48	.....
N. T.	1,921,685	20,129	18,481	*8.18	48,000
Can.	3,729,665	5,871,315	7,206,643	84.17	3,689,257

\* Decrease per cent.

The following table shows the increase of the area of Manitoba, Ontario, and Quebec, and the decrease of the area of the Northwest Territories, effected by the Boundary Extension Acts of 1912, together with the present area and the population adjusted to the 1911 census:

	Increase sq. mi.	Present area	Pop. '11
Manitoba	178,100	251,832	461,680
Ontario	146,400	407,262	2,527,292
Quebec	854,961	706,834	2,005,779
Northwest Territories	*679,461	1,242,224	5,900

\* Decrease.

The 1911 census returned the male population at 3,821,995, and the female at 3,384,648; the number of females to each 1000 males was 886, as compared with 952 in 1901. Deficiency of females is probably greater in Canada than in any other country. In 1911 the male population of Canada (exclusive of Yukon and the Northwest Territories) 18 to 45 years of age was 1,720,070, of whom 1,109,383 were Canadian-born, 306,377 British-born, and 304,310 foreign-born.

The number of inhabitants returned in 1911 as having been born in Canada was 5,619,682 (77.98 per cent); British Isles, 784,526 (10.89); British possessions other than Canada, 29,188 (0.41). There were 19,703 persons of British birth but unknown birthplace. Foreign-born inhabitants in 1911 numbered 752,732 (10.44 per cent). Persons born in Austria-Hungary numbered 121,430 (1.68 per cent); Russia (including Finland), 100,971 (1.40); Germany, 39,577 (0.55); Norway and Sweden, 49,194 (0.68); Italy, 34,739 (0.48); France, 17,619 (0.24); China, 27,983 (0.38); Japan, 8425 (0.12); the United States, 303,680 (4.21). In consequence of the great war, it is of interest to note that of the foreign-born inhabitants 177,720 came from Allied countries,

167,441 from enemy countries, and 407,571 from neutral countries. Of the total number of foreign-born, 344,557, or nearly 46 per cent, were naturalized British subjects in Canada; these included 60,949 persons born in Austria-Hungary, 23,283 in Germany, and 152,308 in the United States. Of the immigrant population born in the United States, 136,720 were of British, 45,374 were of German, and 1804 were of Austro-Hungarian origin. Of the total of 752,732 foreign-born persons in Canada in 1911, 470,927 (62.6 per cent) were males, the males among those of enemy countries being for Austria-Hungary 77,562 and for Germany 39,577. The immigration records show that for the fiscal years 1912 to 1915 78,999 Austro-Hungarians and 17,626 Germans entered Canada; no statistics of departures are available.

The 1911 census returned the urban population at 3,280,964 (45.53 per cent), and the rural population at 3,925,679 (54.47 per cent). In all Canada the urban population increased by 1,259,165 (62.28 per cent) between 1901 and 1911, while the rural population increased by only 576,163 (17.20 per cent). Population of the larger cities and towns at the 1911 census: Montreal (P. Q.), 470,480; Toronto (Ont.), 376,538; Winnipeg (Man.), 136,035; Vancouver (B. C.), 100,401; Ottawa (Ont.), 87,062; Hamilton (Ont.), 81,969; Quebec (P. Q.), 78,710; Halifax (N. S.), 46,619; London (Ont.), 46,300; Calgary (Alta.), 43,704; St. John (N. B.), 42,511; Victoria (B. C.), 31,660; Regina (Sask.), 30,213; Edmonton (Alta.), 24,900; Brantford (Ont.), 23,132; Kingston (Ont.), 18,874; Maisonneuve (P. Q.), 18,684; Peterborough (Ont.), 18,360; Hull (P. Q.), 18,222; Windsor (Ont.), 17,829; Sydney (N. S.), 17,723; Glace Bay (N. S.), 16,562; Fort William (Ont.), 16,499; Sherbrooke (P. Q.), 16,405; Berlin (Ont.), 15,196; Guelph (Ont.), 15,175.

The returns of the 1911 census on occupations of the people relate to persons 10 years of age and over and do not include the population (26,993) of Yukon and the Northwest Territories. Out of a total of 7,179,650, the occupation was recorded of 2,723,634, constituting nearly 38 per cent of the total population and 49 per cent of the population 10 years of age and over. Of the number engaged in gainful occupations 2,358,813 (79.5 per cent) were males, and 364,821 (14.3 per cent) were females. It must be remembered that women performing household duties in their own homes are arbitrarily regarded in the census as not being "gainfully employed" and are therefore excluded from the statistics of oc-

Occupations	1901					1911				
	Males		Females		Total	Males		Females		Total
	No.	P.c.	No.	P.c.	P.c.	No.	P.c.	No.	P.c.	P.c.
Agriculture	707,924	45.8	8,986	3.8	40.2	917,848	38.9	15,887	4.4	34.3
Building trades	218,264	18.8	43	...	12.0	245,990	10.4	211	...	9.0
Domestic and personal service	52,478	8.4	111,197	46.7	9.8	75,138	8.2	138,879	38.1	7.8
Civil and municipal government	16,414	1.1	892	0.4	1.0	72,581	8.1	4,073	1.1	2.8
Fishing and hunting	27,197	1.8	28	...	1.5	34,547	1.5	265	...	1.3
Forestry	16,764	1.1	...	...	0.9	42,901	1.8	18	...	1.6
Manufactures	218,956	18.8	60,219	25.3	15.4	392,781	16.6	98,561	27.0	18.0
Mining	28,646	1.8	4	...	1.6	62,706	2.6	61	...	2.3
Miscellaneous	451	...	39	...	...	...	...	...	...	...
Professional	44,899	2.9	88,320	16.1	4.6	62,781	2.7	57,835	15.9	4.5
Trade and merchandising	143,248	9.3	17,162	7.2	9.0	240,908	10.2	42,184	11.6	10.4
Transportation	79,647	5.2	1,109	0.5	4.5	210,692	9.0	6,852	1.9	8.0
Total workers	1,544,888	100.0	237,949	100.0	100.0	2,358,818	100.0	364,821	100.0	100.0

cupations. The census revealed that the number of agricultural producers has not kept pace with the increase in population. From 1891 to 1911 the increase in the total population within the present limits of the nine provinces was 49.5 per cent, while the increase in the number employed in agriculture was only 27 per cent. However, the increase in the use of agricultural machinery offsets in some degree the decrease in the proportional number of primary producers. The number of persons employed in the various manufacturing industries increased over 116 per cent between 1891 and 1911, and the number employed in the distribution of commodities over 250 per cent. The table on the preceding page shows the number and percentage of male and female workers, and the percentage of total workers, in each industry, in 1901 and 1911.

As reported for fiscal years, immigration into Canada reached its highest point in the year ending March 31, 1913; a marked decline followed the outbreak of the great war. Below are shown the number of immigrant arrivals from the United Kingdom and the United States, the aggregate from other countries, and the total, for fiscal years:

	<i>U. Kingdom</i>	<i>U. States</i>	<i>Other</i>	<i>Total</i>
1912 ...	188,121	138,710	82,406	854,287
1913 ...	150,542	139,009	112,881	402,432
1914 ...	142,622	107,530	134,726	384,878
1915 ...	43,276	59,779	41,784	144,789
1916 ...	8,664	36,987	2,936	48,587

Immigrants whose destination was the Maritime Provinces numbered, in the fiscal years 1915 and 1916 respectively, 11,104 and 5981; Quebec, 31,053 and 8274; Ontario, 44,873 and 14,743; Manitoba, 13,196 and 3487; Saskatchewan, 16,173 and 6001; Alberta, 18,263 and 7215; British Columbia, 10,127 and 2836.

**RELIGION AND EDUCATION.** Adherents of the larger religious denominations according to the 1911 census, with the increase per cent since 1901: Roman Catholics, 2,833,041 (increase 27.06 per cent); Presbyterians, 1,115,324 (32.39); Methodists, 1,079,892 (17.78); Anglicans, 1,043,017 (53.05); Baptists, 382,666 (20.33); Lutherans, 229,864 (148.43); adherents of the Orthodox Church, 88,507 (466.26); Jews, 74,564 (354.63); Mennonites, 44,611 (40.30); Congregationalists, 34,054 (20.36).

Of the population six years of age and over at the 1911 census, viz., 6,154,511, the number returned as being unable to read was 521,842 (8.48 per cent). All the provinces except Quebec have compulsory-education laws. Except for certain small fees payable in parts of Quebec, elementary instruction is free and its cost is defrayed from the public revenues, provincial and local. The following table shows, for 1915, number of schools, of teachers, and of pupils enrolled, the percentage of average attendance, and the expenditure for public education (year ending December 31st for Alberta, Ontario, Prince Edward Island, and Saskatchewan; July 31st for Nova Scotia; and June 30th for British Columbia, Manitoba, New Brunswick, and Quebec):

	<i>Schools</i>	<i>Teachers</i>	<i>Enroll.</i>	<i>Av. at.</i>	<i>Expend.</i>
Alta. ...	2,188	4,218	97,286	62.81	\$7,965,470
B. C. ...	780	1,815	60,352	81.46	8,917,446
Man. ...	2,727	2,976	100,963	67.6	7,116,898

	<i>Schools</i>	<i>Teachers</i>	<i>Enroll.</i>	<i>Av. at.</i>	<i>Expend.</i>
N. B. ...	1,964	2,106	66,505	67.18	1,059,811
N. S. ...	2,795	2,945	107,768	65.3	1,593,026
Ont. ...	6,600	11,850	505,074	66.69	14,267,476
P. E. I. ...	477	586	18,402	63.54	259,671
P. Q.* ...	5,880	7,755	244,607	75.67	8,896,988
Sask.* ...	3,055	4,501	111,059	57.02	8,588,462

\* Figures are for 1914. † For elementary schools.

In the foregoing table, secondary schools are not included in the figures for Ontario and Quebec. Ontario had, in 1915, 160 collegiate institutes and high schools, with 1020 teachers, 38,426 students, and an average attendance of 64.60 per cent. Quebec had, in 1914: 718 model (intermediate) schools, with 3421 teachers, 114,738 pupils, and an average attendance of 82.15 per cent; 296 academies, with 3143 teachers, 76,550 students, and average attendance 85.16; 21 Roman Catholic colleges, with 726 teachers and 8444 students.

**AGRICULTURE.** In 1916 agricultural production was in general much smaller than in the preceding year. The following table shows for important crops the area in thousands of acres, in 1915 and 1916, and the production in thousands of bushels or tons, in 1914, 1915, and 1916 (figures for 1916 subject to slight revision):

	<i>Area</i>		<i>Production</i>		
	<i>1915</i>	<i>1916</i>	<i>1914</i>	<i>1915</i>	<i>1916</i>
	<i>ac.</i>	<i>ac.</i>	<i>bu.</i>	<i>bu.</i>	<i>bu.</i>
Wheat .....	12,986	10,085	161,280	376,804	159,126
Rye .....	112	160	2,017	2,894	2,059
Barley .....	1,509	1,898	86,201	58,331	82,298
Oats .....	11,865	10,644	818,078	520,103	388,466
Flaxseed .....	467	.....	16,388	17,528	.....
Potatoes .....	479	449	85,672	62,604	61,128
Turnips, etc..	178	156	69,008	64,281	41,256
Hay & clover	7,875	7,974	10,259	10,953	14,799
Fodder corn.	343	297	3,251	3,430	1,977
Sugar beets.	18	15	109	141	71
Alfalfa .....	93	90	218	262	261

The area estimated as under field crops in 1915 was 37,063,455 acres, as compared with 35,102,175 acres, the sown area, and 33,436,675, the harvested area, in 1914. The total value of field crops, computed at average local market prices, was \$797,669,500 in 1915, as compared with \$638,580,300 in 1914. The 1915 value consisted of \$568,161,900 for grain crops, \$192,768,100 for fodder crops, and \$36,739,500 for potatoes and sugar beets. The 1915 grain crops included: wheat, valued at \$312,569,400; rye, \$1,899,900; barley, \$26,704,700; oats, \$176,894,700; corn for husking, \$10,243,000; mixed grains, \$10,034,700; peas, \$5,730,700; beans, \$2,206,800; buckwheat, \$5,913,000; flaxseed, \$15,965,000. Average prices per bushel in 1914 and 1915 respectively: wheat, \$1.22 and 83 cents; rye, 83 and 79 cents; barley, 62 and 50; oats, 48 and 34; peas, \$1.46 and \$1.66; beans, \$2.31 and \$3.05; corn for husking, 71 and 71 cents; flaxseed, \$1.03 and \$1.50; potatoes, 49 and 57 cents; turnips, etc., 27 and 26. Average prices per ton in 1914 and 1915: hay and clover, \$14.23 and \$14.22; fodder corn, \$4.91 and \$4.96; sugar beets, \$5.99 and \$5.50; alfalfa, \$14.17 and \$12.98.

The following table shows the area, in thousands of acres, and the yield, in thousands of bushels, of wheat, barley, oats, and flaxseed in

the Northwest Provinces (Manitoba, Saskatchewan, and Alberta), in 1914 and 1915:

		Wheat	Barley	Oats	Flaxseed
<b>Manitoba:</b>					
Acres	1914	2,616	468	1,381	40
	1915	3,342	490	1,441	84
Bushels	1914	38,605	9,828	31,951	388
	1915	96,425	17,763	69,471	374
<b>Saskatchewan:</b>					
Acres	1914	5,348	290	2,520	958
	1915	6,838	287	2,987	697
Bushels	1914	73,494	4,901	61,816	6,181
	1915	195,168	10,570	157,629	9,061
<b>Alberta:</b>					
Acres	1914	1,371	178	1,502	80
	1915	1,564	185	1,912	70
Bushels	1914	28,859	4,806	57,076	614
	1915	51,355	6,984	107,741	1,124
<b>Northwest Provinces:</b>					
Acres	1914	9,385	986	5,853	1,078
	1915	11,745	962	6,290	801
Bushels	1914	140,958	19,585	150,843	7,088
	1915	342,948	35,317	334,840	10,559

By provinces, the total areas and value of field crops in 1914 and 1915 were as follows:

	Acres		Value	
	1914	1915	1914	1915
Alta.	3,369,270	3,966,980	\$59,779,600	\$79,409,200
B. C.	260,640	292,880	11,463,000	11,625,700
Man.	4,671,790	5,529,550	65,528,400	119,447,000
N. B.	904,055	893,940	20,045,100	20,096,400
N. S.	693,860	727,260	21,969,700	19,556,700
Ont.	8,973,700	9,391,500	196,220,000	207,048,500
P. E. I.	461,510	481,985	11,544,000	10,982,700
P. Q.	4,863,850	4,901,760	99,279,000	104,688,000
Sask.	9,238,000	10,877,650	152,751,500	224,875,300
Can.	33,436,675	37,063,455	\$638,580,800	\$797,669,500

Estimated number of live stock on farms in Canada June 30, 1915, and June 30, 1916, respectively, with percentage of decrease or, in respect of cattle other than milch cows, of increase: Horses, 2,996,099 and 2,990,635 (0.2 per cent); milch cows, 2,666,846 and 2,603,345 (2.4); other cattle, 3,399,155 and 3,826,519 (12.6); sheep, 2,038,662 and 1,965,101 (3.6); swine, 3,111,900 and 2,814,672 (9.6). See AGRICULTURAL EXPERIMENT STATIONS; AGRICULTURAL LEGISLATION; DAIRYING.

**PUBLIC LANDS AND HOMESTEADS.** The crown lands of the Dominion are in the Northwest Provinces and in the railway belt of British Columbia. Of these lands large areas are offered in free grants as homesteads for settlers. The total number of acres surveyed to Jan. 1, 1916, was 198,937,027, of which 138,780,827 acres had been alienated from the crown and 60,156,200 acres remained for disposal; of the latter number, 4,015,300 acres were under timber licenses, 5,049,400 under grazing leases, 26,615,500 in forest reserves and parks, and 25,476,000 available for homestead entry.

The total sales of land held under government grant by the Hudson's Bay Company and by railways amounted to \$7,398,191 for 501,575 acres in the fiscal year 1914 and \$3,279,031 for 192,801 acres in 1915. In the two years respectively, the share of the Canadian Pacific Railway was \$4,242,089 and \$2,496,872.

In 1915, the total number of ordinary homestead entries for lands of the Dominion government was 17,532, as compared with 25,623 in 1914 and 31,499 in 1913. In 1915, 4113 entries were made in Manitoba (against 4252 in 1914), 6349 in Saskatchewan (against

9752), 6584 in Alberta (against 10,722), and 466 in British Columbia (against 847). The number of preëmptions under the Dominion Lands Act was 2210 in 1915 (1648 in Saskatchewan, 562 in Alberta), against 3262 in 1914 (2417 in Saskatchewan, 845 in Alberta). The number of purchased homesteads under the Act was 285 in 1915 (197 in Saskatchewan, 88 in Alberta), against 422 in 1914 (290 in Saskatchewan, 132 in Alberta).

Outside of the Northwest Provinces there are large areas of provincial public lands (except in Prince Edward Island, which is entirely settled); these lands are available for settlement in free grant or at low prices.

**FISHERIES.** The value, as officially reported, of all fish, fish products, and marine animals taken in both sea and inland fisheries was \$31,264,631 in the year 1914-15, as compared with \$33,207,748 in 1913-14. Value by provinces in 1913-14 and 1914-15 respectively, in thousands of dollars: Alberta, 81 and 87; British Columbia, 13,891 and 11,515; Manitoba, 606 and 849; New Brunswick, 4309 and 4940; Nova Scotia, 8298 and 7730; Ontario, 2675 and 2755; Prince Edward Island, 1280 and 1262; Quebec, 1850 and 1924; Saskatchewan, 149 and 132; Yukon, 68 and 70. To the total amount in 1914-15 the sea fisheries contributed \$27,198,257, and the inland fisheries \$4,066,374. Number of persons employed in the fishing industry in 1913-14, 96,669; in 1914-15, 94,513, of whom 84,108 in sea fisheries and 10,405 in inland fisheries.

**MINING.** According to the preliminary report of the Dominion Department of Mines, the total value of the mineral production in 1915 was \$138,513,750, as compared with the finally revised totals of \$128,863,075 in 1914 and \$145,634,812 in 1913. The figure for 1913 is the highest hitherto recorded. The cutting off of markets and the closing of metal exchanges after the outbreak of the great war in 1914 resulted in the closing down or restriction of operation at many properties. Recovery or readjustment came in the following year. According to an official statement, the demand in 1915 for copper, lead, nickel, and zinc "led to great activity in the operation of the already developed deposits of these metals, and also, later in the year, to the opening up of old and the exploitation of new deposits. The capacities of steel furnaces were taxed to the utmost to meet the demand for shell steel. Amongst non-metallic minerals the recovery of benzol and toluol in by-product coke oven operations was a direct result of the war, as was also the activity in the mining and shipment of magnesite and of chrome ores."

Value of the mineral production by provinces, with percentage of total (figures for 1915 subject to revision):

	1914	P.c.	1915	P.c.
Alta.	\$12,684,234	9.87	\$9,915,282	7.16
B. C.	24,164,039	18.80	26,932,658	20.89
Man.	2,413,489	1.88	1,351,604	0.97
N. B.	1,014,570	0.79	916,329	0.66
N. S.	17,584,639	13.68	18,126,672	13.09
Ont.	53,034,677	41.01	61,800,178	44.62
P. Q.	11,836,929	9.21	12,159,436	8.78
Sask.	712,313	0.55	395,728	0.28
Yukon	5,418,185	4.21	4,915,863	3.55
Total	128,863,075	100.00	138,513,750	100.00

The table below shows the quantities (in thousands) and the values (in thousands of dollars) of minerals produced in Canada in 1914 and 1915:

	Quantities (1000)		Dollars (1000)	
	1914	1915	1914	1915
Copper, lb. ....	75,736	102,612	10,302	17,726
Gold, oz. ....	773	916	15,988	18,937
Pig iron,* tons. ....	95	159	1,139	1,741
Lead, lb. ....	36,338	45,377	1,628	2,541
Nickel, lb. ....	45,518	68,078	13,655	20,423
Silver, oz. ....	28,450	28,402	15,594	14,088
Other metallic prod. ....			1,087	1,589
<b>Total</b> .....				
Asbestos and asbestic, tons .....	118	139	2,910	3,513
Coal, tons .....	13,638	13,209	33,472	31,958
Gypsum, tons .....	517	470	1,156	850
Natural gas, M. ft. ....	21,693	18,320	3,485	3,801
Petroleum, bbl. ....	215	215	343	301
Pyrites, tons .....	228	297	745	1,029
Salt, tons .....	107	120	494	600
Cement, bbl. ....	7,172	5,681	9,188	6,977
Clay products .....			6,872	3,931
Lime, bu. ....	7,029	4,933	1,361	1,016
Stone .....			5,469	4,505
Miscellaneous .....			3,983	3,488
<b>Total non-metals</b> .....			69,476	61,468
<b>Grand total</b> .....			128,863	138,514

\* From Canadian ore only.

COMMERCE. The following table shows, for fiscal years ending March 31st, the values in dollars of imports of dutiable merchandise, free merchandise, and coin and bullion, together with the values of the total imports:

	Merchandise		Coin & bullion	Total imports
	Dutiable	Free		
1910	241,961,556	143,873,547	6,017,589	391,852,692
1913	456,086,187	230,518,226	5,427,979	692,032,392
1914	425,324,576	210,186,916	15,235,805	650,746,797
1915	318,951,094	178,500,808	131,992,992	629,444,894
1916	310,193,014	220,052,580	34,260,202	564,505,796

The values in dollars of exports have been as follows, in fiscal years:

	Merchandise		Coin & bullion	Total exports
	Canadian	Foreign		
1910	279,247,551	19,516,442	2,594,536	301,358,529
1913	355,754,600	21,313,755	16,163,702	393,232,057
1914	431,588,439	23,848,785	23,560,704	478,997,928
1915	409,418,836	52,023,673	29,366,368	490,808,877
1916	741,610,638	37,689,432	103,572,432	882,872,502

Imports of merchandise for consumption, as compared with exports of Canadian merchandise, are shown below, for fiscal years:

	1913	1914	1915	1916
Imps.	670,089,066	618,457,144	455,446,312	507,917,159
Exps.	355,754,600	431,588,439	409,418,836	741,610,638

The principal imports for consumption, in the fiscal years 1915 and 1916 respectively, included the following, valued in thousands of dollars: Metals and minerals and manufactures thereof, 34,366 and 103,414 (of which iron and steel and manufactures thereof, 64,759 and 76,329); coal, coke, etc., 38,620 and 32,521; cotton and manufactures thereof, 27,399 and 32,470; wool and manufactures thereof, 24,830 and 32,371; sugar, molasses, etc., 19,033 and 22,735; drugs, dyes, chemicals, and medicines,

13,449 and 17,096; fruits, 15,469 and 14,330; oils, 13,345 and 13,943; hides and skins other than fur, 12,843 and 12,442; provisions, 5935 and 11,963; breadstuffs, 13,982 and 11,087; carriages, automobiles, etc., 8523 and 10,869; rubber and gutta-percha and manufactures thereof, 7767 and 9886; silk and manufactures thereof, 8139 and 8709; tea, 7364 and 8272; leather and manufactures thereof, 7059 and 6514; tobacco, 5801 and 5753.

The following table shows for fiscal years the exports of Canadian produce by great classes, values in thousands of dollars:

	1913	1914	1915	1916
Mining products...	57,443	59,039	51,741	66,590
Fisheries products...	16,337	20,624	19,687	22,378
Forest products...	43,255	42,792	42,651	51,271
Animal products...	44,785	53,349	74,391	102,882
Agricultural prod. ....	150,146	198,220	134,746	249,661
Manufactured prod. ....	43,693	57,443	85,540	242,035
Miscellaneous .....	97	121	664	6,793
<b>Total</b> .....	355,755	431,588	409,418	741,611

The table below shows, for fiscal years, the exports of Canadian wheat and oats, total grain, and wheat flour, quantities in thousands and values in thousands of dollars:

	1913	1914	1915	1916
Wheat, bu. ....	93,166	120,427	71,913	157,745
Wheat, \$ .....	88,609	117,719	74,294	172,896
Oats, bu. ....	10,479	34,997	17,769	26,816
Oats, \$ .....	5,068	13,380	8,961	14,638
Total grain, bu. ....	110,571	168,929	96,573	191,857
Total grain, \$ .....	97,941	138,129	88,018	192,827
Wheat flour, bu. ....	4,478	4,832	4,952	6,400
Wheat flour, \$ .....	19,971	20,581	24,611	35,767

Important exports of Canadian produce, in addition to those given above, were as follows in the fiscal years 1915 and 1916, values in thousands of dollars: gold, 15,407 and 16,870; silver, 13,516 and 14,298; copper, 7545 and 14,670; coal, 4466 and 6033; asbestos, 2227 and 2962; dry salted codfish, 4122 and 5418; canned salmon, 4949 and 6306; canned lobsters, 3014 and 2672; planks and boards, 18,921 and 23,880; deals, 7542 and 10,927; wood blocks for pulp, 6817 and 5744; wood pulp, 9266 and 10,377; shingles, 2988 and 3644; logs, 1259 and 1079; cattle, 9268 and 12,626; horses, 1842 and 4701; hides and skins other than fur, 7730 and 6759; furs, dressed and undressed, 2757 and 4778; bacon and hams, 14,465 and 27,090; cheese, 19,214 and 26,691; butter, 640 and 1019; fruits, 2657 and 1766; hay, 2233 and 5849; carriages, automobiles, etc., 3498 and 11,372; agricultural implements, 2802 and 3554; cotton manufactures, 507 and 1816; household effects, 3682 and 4222; iron and steel manufactures, 11,407 and 50,962; leather and manufactures thereof, 10,807 and 14,575; liquors, 1102 and 1432.

By principal countries, imports for consumption have been valued as follows for fiscal years, in thousands of dollars:

	1913	1914	1915	1916
United States .....	441,143	410,786	428,617	398,695
United Kingdom .....	138,749	132,071	90,161	80,075
France .....	15,380	14,277	8,449	5,949
Newfoundland .....	2,057	1,841	1,245	1,578
South America .....	10,529	9,020	9,594	12,730
West Indies .....	10,577	11,504	11,089	7,829
Germany .....	14,215	14,586	5,087	86
Belgium .....	4,020	4,490	1,876	59

Total exports by principal countries, for fiscal years, in thousands of dollars:

	1913	1914	1915	1916
United States .....	167,110	200,459	215,409	320,225
United Kingdom.....	177,932	222,823	211,759	463,081
France .....	2,565	3,811	14,596	36,086
Newfoundland .....	4,728	4,770	4,481	5,071
South America .....	4,352	4,026	2,114	5,093
West Indies .....	6,237	6,998	6,418	6,839
Germany .....	3,402	4,434	2,162	.....
Belgium .....	4,809	4,820	3,259	385

The two foregoing tables include coin and bullion. Imports of coin and bullion from the United States and exports thereto in the fiscal year 1914 were \$15,220,763 and \$23,511,074 respectively; in 1915, \$131,984,421 and \$29,066,470; in 1916, \$28,197,146 and \$103,555,818. These figures, as may be seen from the first two tables in this section, include most of the transfers of coin and bullion in the years mentioned.

**SHIPPING.** Vessels entered, including those employed in the coasting trade, numbered 140,597, of 72,667,084 tons, in the fiscal year 1914, and cleared 134,542, of 67,609,208 tons; in 1915, 132,304, of 65,357,422 tons, and 126,888, of 61,346,713 tons. The number of sea-going vessels entered in 1914 was 18,320, of 14,982,393 tons, and cleared, 17,695, of 14,586,093 tons; in 1915, 17,182, of 13,132,944 tons, and 16,730, of 12,269,642 tons.

**COMMUNICATIONS.** The length of railway in operation June 30, 1915, was 35,582 miles, the increase of 4788 miles during the year then ended being the largest hitherto recorded. In the fiscal year 1915, gross railway earnings were \$199,843,072 and working expenses \$147,731,099, the percentage of expenses as compared with earnings being 73.92, against 73.63 in 1914 and 70.90 in 1913. During the year ending June 30, 1915, the sum of \$66,990,127 was added to the capital liability of steam railways in operation; stocks increased \$2,977,412 and funded debt \$69,322,267, and there was a decrease in stock of \$5,300,552 due to an adjustment of capitalization by the Canadian Northern and subsidiary corporations. These changes brought the total capitalization of steam railways in operation to \$1,875,810,888 on June 30, 1915, as compared with \$1,808,820,761 in 1914. If the capitalization of railways under construction be added to that of the operating railways, the total is increased to \$1,957,292,392, of which \$877,058,601 stocks, \$176,284,882 consolidated debenture stock, and \$903,948,909 funded debt. See RAILWAYS.

The table below shows by provinces the mileage of steam railways in operation at the end of fiscal years:

	1910	1911	1912	1913	1914	1915
Ont. ....	8,230	8,322	8,546	9,000	9,255	10,702
P. Q. ....	3,795	3,882	3,882	3,986	4,043	4,677
Man. ....	3,221	3,466	3,520	3,993	4,076	4,498
Sask. ....	2,932	3,121	3,754	4,651	5,089	5,327
Alta. ....	1,488	1,494	1,897	2,212	2,545	3,174
B. C. ....	1,832	1,842	1,855	1,951	1,978	3,100
N. B. ....	1,522	1,548	1,545	1,545	1,839	1,962
N. S. ....	1,351	1,354	1,357	1,360	1,365	1,367
P. E. I. ....	268	269	269	279	279	275
Yukon ....	91	102	103	102	102	102
In U. S. ....	.....	.....	.....	225	224	398
Total .....	24,731	25,400	26,727	29,304	30,795	35,582

Electric railways, computed as single track, had a total mileage of 2103 in 1915, as compared with 2052 in 1914.

Railway construction reached a low point in Canada in 1916 as the mileage constructed amounted to but 290 miles, as compared with 718 in 1915, and 1978 in 1914. Furthermore it was reported that the removal of tracks in service taking place in 1916 and to be continued, for shipment to France for use about the war front was actually decreasing the total of line operated. Aside from war conditions there undoubtedly had been for several years excessive railway construction in Canada so that there was in 1916 a much greater mileage in proportion to population than in any other country. As an additional consideration just previous to the war there had been business depression which also contributed to the necessary curtailment. The most important construction work of the year was the completion of the five-mile Connaught tunnel, while passenger stations were built by the Canadian Pacific at North Toronto and at Quebec and work was in progress on the Toronto union station. At Vancouver, B. C., the new passenger and freight terminal of the Vancouver, Victoria, and Eastern was being completed. The greatest amount of first track construction during the year was on the Edmonton, Dunvegan, and British Columbia, involving 21 miles on the main line, 50 miles on the Edmonton Dunvegan, Grand Prairie branch, 40 miles on the Alberta Great Waterways, and 5 miles on the Central Canada, Peace River branch. On the Hudson Bay Railway 96 miles were completed in Manitoba, and on the Pacific Great Eastern 37 miles were built from Clinton, B. C., to Horse Lake Summit. The Canadian Government Railways had their new terminal facilities at Halifax 85 per cent completed at the end of the year, and a substantial beginning had been made on the new grain elevator and tracks at St. John, on the Prince Edward Island car ferry and terminals and on the grain elevator at Transana. On the Canadian Northern (Western Lines) considerable construction was under way in Alberta, while on other lines minor construction, replacements, or improvements were under way.

It was announced late in 1916 that the British government had requested the railways of Canada to supply 1200 to 1500 miles of track, including rails and other track material for immediate use in France. The transportation facilities behind the western front were not proving adequate to permit the Allies to take full advantage of the munitions and other supplies available.

By December 300 miles of Canadian government railways' sidings had been taken up to be shipped. Next were to follow the taking up of 220 miles of track in the mountain section between Edmonton, Alberta, and the coast, where in some places the Canadian Northern and Grand Trunk Pacific are nearly parallel.

The Canadian telegraph systems include lines owned and operated by the Dominion government and lines owned and operated by railway and telegraph chartered companies. The government lines on March 31, 1915, had a total length of 11,497 miles, with 870 offices. On June 30, 1915, the Canadian Pacific Railway had 14,633 miles of line, 106,066 miles of wire; Grand Trunk Pacific Telegraph Co., 4639 and 13,229; Western Union, 2581 and 12,879; National Transcontinental Railway, 1990 and



4834; Great Northwestern Telegraph Co. (in 1914), 9563 and 30,134; Canadian Northern Railway (in 1914), 5924 and 18,233. In 1915, the government maintained 59 radiotelegraph stations. Miles of telephone wire in 1915, 1,452,360.

**FINANCE.** The Canadian monetary unit is the dollar, equivalent to the American dollar; the standard of value is gold. The system of public finance includes a consolidated fund and miscellaneous accounts. To the consolidated fund are paid in the revenues, and out of it are paid the expenditures, properly relating to the fiscal year. The miscellaneous accounts comprehend loans, debt redemption, railway administration, capital expenditure on public works, etc. The revenue and the expenditure of the Dominion government are shown in the table below for fiscal years. The several items are indicated as follows: *a* expenditure chargeable to consolidated fund; *b* expenditure chargeable to capital; *c* railway subsidies; *d* other charges; *e* total disbursements; *f* revenue on account of consolidated fund; *g* other revenues; *h* total revenue; *i* difference between receipts and disbursements; *j* sinking funds; *k* net difference between receipts and disbursements.

	1912	1913	1914	1915
	\$	\$	\$	\$
a	98,161,441	112,059,537	127,384,473	135,523,207
b	30,989,576	-27,208,046	87,180,176	41,447,820
c	859,400	4,935,507	19,086,237	5,191,507
d	7,181,665	255,787	2,640,162	165,936,492
e	137,142,082	144,456,877	186,241,048	248,098,526
f	136,108,217	168,689,903	163,174,395	133,073,482
g	.....	524	.....	.....
h	136,108,217	168,690,427	163,174,395	133,073,482
i	1,033,865	24,233,550	23,066,653	115,025,044
j	1,156,456	1,884,285	1,371,428	1,645,812
k	*122,591	*25,617,835	†21,695,234	†118,379,232

\* Net excess of receipts. † Net excess of expenditure.  
‡ Including expenditure on account of war appropriation \$80,750,476.

In the fiscal years 1914 and 1915 respectively, receipts from customs were \$104,691,238 and \$75,941,220; excise, \$21,452,037 and \$21,479,731; post office, \$12,954,530 and \$13,046,665; railways, \$13,394,317 and \$12,149,357; miscellaneous, \$10,682,272 and \$10,456,509; total, \$163,174,395 and \$133,073,482. Expenditure chargeable to consolidated fund has been as follows, in fiscal years:

	1913	1914	1915
Debt charges *	\$14,493,155	\$14,752,117	\$17,937,284
Prov. subsidies	13,211,800	11,280,469	11,451,678
Civil gov't.	5,109,459	5,607,795	6,157,967
Public works	18,468,505	19,007,518	19,843,582
Defense	9,114,533	11,151,399	10,060,618
Rev. collection	33,006,201	39,084,657	42,232,953
Other	23,655,384	26,500,524	28,339,180
Total	\$112,059,537	\$127,384,473	\$135,523,207

\* Interest on the public debt amounted to \$12,605,882 in the fiscal year 1913, \$12,893,505 in 1914, and \$15,736,743 in 1915.

The public debt on March 31, 1915, was \$700,473,812; assets, \$251,097,731; net debt, \$449,376,083, as compared with \$335,996,850 in 1914. See FINANCIAL REVIEW.

**ARMY.** The recruitment of volunteers for the Canadian forces continued during 1916 and in the speech from the throne at the close of Parliament on May 18th it was stated that in the first four months of the year more recruits had offered themselves than in any other similar period of the war. At that time it was stated that nearly 170,000 Canadians had gone overseas and that more than 140,000 were under training in Canada. On September 6th there were under arms 361,693 Canadians, enlistments having been: May, 15,090; June, 10,796; July, 8675; August, 7246. Up to this time the killed, wounded, and missing had amounted to 30,000. There had been a total of 250,000 men trained and sent abroad and 400 munitions factories had been established from which an output valued at \$30,000,000 monthly was forthcoming. There were maintained numerous training camps for the volunteers, the largest of which was Camp Borden in Ontario, and the men sent to the front in Europe were distinguishing themselves. The method of training had proved most effective and the response generally loyal.

**NAVY.** The only ships of fighting value are the cruisers *Niobe* (11,000 tons) and *Rainbow* (3000), and two submarines. Soon after the outbreak of the great war they were placed at the disposal of the British government.

**GOVERNMENT.** The executive power is exercised in the name of the King of Great Britain and Ireland by a governor-general, who is appointed by the crown and who acts through a privy council, or responsible ministry. The legislative power devolves upon a parliament of two Houses, the Senate and the House of Commons. The duration of a parliament is five years. The 12th Parliament opened Nov. 15, 1911, but by Act of the British Parliament June 1, 1916, the duration of the Canadian Parliament was extended until Oct. 7, 1917. Senators, nominated for life by the Governor-General, are 87 in number; in the 13th Parliament, they will number 93. Members of the House of Commons numbered 221 in 1916; they are elected by direct vote for the duration of Parliament. In the 13th Parliament, they will number 234, apportioned as follows: Quebec, 65; Ontario, 82; Nova Scotia, 16; New Brunswick, 11; Prince Edward Island, 3; Manitoba, 15; Saskatchewan, 16; Alberta, 12; British Columbia, 13; Yukon Territory, 1.

On Aug. 19, 1916, the Duke of Devonshire (q.v.) was appointed to succeed Prince Arthur, Duke of Connaught, as Governor-General. The Duke of Connaught was appointed March 21, 1911, and assumed office October 31st of that year. The Conservative ministry of Sir Robert Laird Borden, which succeeded the Liberal ministry of Sir Wilfrid Laurier Oct. 10, 1911, was composed as follows in 1916 (dates of appointment are here given only in the case of members who entered the ministry after Oct. 10, 1911): Premier and president of the privy council, Sir Robert Laird Borden; minister of trade and commerce, Sir George Eulas Foster; interior, William James Roche (Oct. 29, 1912); public works, Robert Rogers (Oct. 29, 1912); railways and canals, Francis Cochrane; finance, Sir William Thomas White; postmaster-general, Thomas Chase Casgrain (Oct. 20, 1914); minister of marine and fisheries, John Douglas Hazen (also minister

of the naval service); justice, Charles Joseph Doherty; militia and defense, Lieut.-Gen. Sir Sam Hughes; secretary of state, Pierre Edouard Blondin (Oct. 20, 1914) — he was also minister of mines; minister of labor, Thomas Wilson Crothers; inland revenue, Esioff Léon Patenaude (Oct. 6, 1915); customs, Dr. John Dowsley Reid; agriculture, Martin Burrell; ministers without portfolio, Sir George Halsey Perley, Albert Edward Kemp, Sir James Alexander Lougheed;—not in the cabinet: solicitor-general, Arthur Meighen (June 26, 1913); parliamentary secretary of militia and defense, Fleming B. McCurdy (July 19, 1916); parliamentary under secretary of state for external affairs, Lieut.-Col. Hugh Clark (Oct. 21, 1916).

Each of the provinces has an elected legislature, and an executive (lieutenant-governor), who is appointed by the Governor-General and acts through a responsible ministry.

### HISTORY

**PARLIAMENT.** In his New Year message, the Premier, Sir Robert Borden, declared that Canada's overseas forces must be increased to 500,000. On February 8th the Canadian House of Commons petitioned the British Parliament for the amendment of the Constitution of Canada known as the British North America Act, extending the present Dominion Parliament for one year. This action was taken on account of the objection to holding an election in war time. On February 15th Sir William Thomas White, minister of finance, introduced the war budget which included a new tax of 25 per cent on war profits. The yield of this and the other new taxes was estimated at \$50,000,000. He announced that in spite of them the ordinary revenues were still so inadequate that a domestic loan would be necessary in order to meet the war expenditure which was estimated at \$250,000,000.

**RECRUITING.** Although under the voluntary system, Canada supplied a remarkably large quota to the armies at the front in proportion to her population. In the summer it was estimated that 350,000 men had been enrolled mainly from the English-speaking population of 4,500,000. Recruiting slackened somewhat in the summer time on account of the demand for labor for the harvest and the industries connected with war supplies. It was estimated at that time that about 200,000 men were employed in the production of munitions; that the government and the banks acting jointly had provided \$150,000,000 for the production of munitions and that contracts amounting to \$400,000,000 had been placed with Canadian companies. Statistics of recruiting in rural communities showed that from 60 to 65 per cent of the men were born in Canada. As to the distribution among the provinces, Ontario in the summer time had contributed 145,195, Quebec 36,890, the four western provinces 136,939, and the three eastern provinces 31,633. It was evident, although there were no statistics to prove it, that labor, organized and unorganized, was supplying its full share. The attitude of the working class generally was loyal to the government and there had been few labor difficulties since the beginning of the war. In one instance, namely, that of the railway organizations, the

men refused to press demands for higher pay upon the companies until after the end of the war. After the prorogation of Parliament, Sir Wilfrid Laurier addressed strong appeals to the French population of Quebec on behalf of enlistment. As the need of greater numbers at the front became evident and the total casualties of Canadian troops were reported at about 50,000, there was talk of compulsory military service, especially among those who had lost relatives in battle. There was an increase in the feeling that the voluntary system was working out unfairly in view of its pressure upon the English-speaking population and it was pointed out that if it proceeded in the same proportion recruiting an army of 500,000 would draw at least 450,000 from the English inhabitants. In the closing months of the year the Prime Minister who had set the figure of 500,000 as the proper quota for the Dominion, issued an appeal in which he pointed out that during the last few months enlistments had decreased and urged all who were fit for military duty to place themselves freely at the disposal of the government. At that time he said more than 370,000 men had enlisted in the Dominion and of these 258,000 had gone overseas. Repeated appeals were addressed not only by Sir Wilfrid Laurier but also by French members of the government to the French-Canadian population in Quebec in order to induce them to enlist, but their indifference and the deterrent effect of Mr. Bourassa's speeches prevented much from being accomplished. As illustrating Mr. Bourassa's attitude, the following passage may be cited: "Here in Canada there is being forged around our necks a militarism unparalleled in any civilized country, a depraved and undisciplined soldiery, an armed rowdiness without faith or law and as refractory to the influence of individual honor as to that of their officers."

The following figures were given as showing the small proportion of enlistments among the native French: "Total enlistments for Quebec 36,000, of which 23,000 were from English speaking natives; while the French population numbers 1,605,339 and the British 316,103."

**POLITICAL DISCUSSION.** The arguments of Liberal leaders like Sir Wilfrid Laurier and the Hon. Rodolphe Lemieux implied the existence of a movement on the part of jingoes to subordinate the interests of Canada to the Imperial government. It was alleged that in England there was a movement to reconstitute the Empire, not on the old lines of liberty, but on the basis of German militarism. Sir Wilfrid saw evidence of an extreme militarist policy and declared that it would be most unfortunate if as a result of a war undertaken to save civilization from militarism, the conquering nations should saddle themselves with militarism. On the other hand, he urged the greatest possible vigor in the prosecution of the war and appealed for recruits. The government did not address itself during the year to these criticisms, apparently taking the stand that union between the parties was essential and that the government ministers ought not to take part in controversies.

**INTERNAL CONDITIONS.** The crop of 1915 had been extremely large and this fact along with the great profits from the placing of orders amounting to \$500,000,000 or \$600,000,000 in



Courtesy of the Review of Reviews  
**THE DUKE OF DEVONSHIRE**  
Governor-General of Canada, 1916



Photo by Paul Thompson, N. Y.  
**GENERAL SIR SAM HUGHES**  
Minister of Militia

CANADA



connection with war materials led to something like a state of artificial prosperity. Personal expenditures which had been restricted at the beginning of the war now seemed to increase again, and it was reported that among the working classes there was less of a tendency to economize even than before the war. Canada's trade for the year ending June 30, 1916, was placed at about \$1,600,000,000, that is, more than \$250 per head of the entire population. It was reported that workmen were more fully employed than usual and that to some extent women were taking the place of the men who were at the front, but they had not entered into industry to any such extent as in Great Britain or in France. Liberal pensions accounted in part for this fact. Since the beginning of the war there had been five war loans, of which two occurred in 1916, namely: In March the loan placed in New York for \$75,000,000, and in September the domestic loan of \$100,000,000. The total from the beginning of the war was \$345,000,000. The liabilities of Canada to the Imperial government on June 30, 1916, were placed at \$162,000,000 against which \$50,000,000, raised from the loan, was placed as a credit, thus reducing the total to \$112,000,000. Each of the loans was very successful and the one for September, 1916, received applications for more than double the amount. For the domestic loans the banks underwrote a large proportion of the amount. The banks aided the government very materially in its credits to the Imperial Munitions Board, which credits in 1916 were as follows: April, \$76,000,000; July, \$24,000,000; November, \$25,000,000; December, \$25,000,000.

**THE LANGUAGE QUESTION.** The discontent of the French-Canadian element appeared again in February, as a result of regulations in the Province of Ontario, restricting the use of the two languages in the schools. The French-Canadian priests in the province united in an effort to prevent recruiting among their parishioners. Three thousand French citizens of Ottawa resolved to pay no taxes until their grievances were redressed. A general trade boycott on behalf of French rights was resolved upon and in some quarters threats of violence were made. The situation became more serious in May, when Sir Wilfrid Laurier, who had hitherto stood firmly against racial division in politics, came out on behalf of the two-language policy, thus dividing the Liberal party along race lines. In the Province of Quebec the Liberals and Nationalists joined hands against the Conservatives, who held to the principle of provincial autonomy as to language. The feeling of the French-Canadians had the effect of virtually stopping enlistment among them. The proportion of the native French in the Canadian army was as noted above only a small fraction of the total number who had enlisted, although they were more than a quarter of the total population. The bi-lingual difficulty arose from the regulation that required English to be taught in French or bi-lingual schools from the beginning of the course, and to be employed as the language of instruction after the first two years. French, however, might be retained as the language of instruction after the two years, if in the judgment of the authorities, circumstances required it, and it was always to be a compulsory subject. A resolution was introduced

in the Dominion House of Commons on behalf of the French-Canadians in Ontario, but failed to pass. It was warmly supported by Sir Wilfrid Laurier, but was opposed by the Prime Minister on constitutional grounds. The purport of it was that during this time of difficulty when the thoughts of every one should be on the winning of the war, the House of Commons, while fully recognizing the principle of provincial rights and acknowledging that every child should have a thorough education, would respectfully suggest to the Legislative Assembly at Ontario "the wisdom of making it clear that the privilege of the children of French parentage being taught in their mother tongue, be not interfered with." The resolution was defeated by the vote of 107 to 60.

**PROVINCIAL ELECTIONS.** In Quebec, Nova Scotia, and British Columbia new legislatures were elected and in each province the Conservative party was decisively defeated. In Quebec only 7 out of 85 members were returned, in Nova Scotia only 11 out of 33. In Quebec Mr. Bourassa and the Nationalists joined with the Liberals. The election followed soon after the debate over the language question in Ontario. In British Columbia the returns showed 36 Liberalists to 10 Conservatives and one Socialist. Charges of extravagance had been brought against the administration of Mr. Bowser. Both under his administration and that of his predecessor, Sir Richard McBride, there had been charges that the railways and the public domain in general had been dealt with in an improvident manner. There had been great speculative activity down to the beginning of the war and the collapse of the government followed the end of this period of inflation. The new Premier was Mr. H. C. Brewster. In Saskatchewan the Premier, Hon. Walter Scott, resigned on account of illness, and was succeeded by Hon. W. M. Martin, of Regina. In the latter part of the Scott ministry charges had been made and later established before royal commissions, of thieving on the part of officials who had charge of the appropriations for railway building and of bribes paid to the members of the Legislature by liquor dealers. The result was the imprisonment of three or four members of the Legislature and the resignation of the Speaker. The members of the government, however, were acquitted of any knowledge of these proceedings.

**COMMERCIAL RELATIONS WITH FRANCE.** A commercial mission was sent to France in order to devise means of improving trade between the two countries, and in general to promote closer commercial relations after the war. No two countries, it was argued, were better fitted to trade in each other's products in large quantities of commodities that did not come into competition. It was pointed out that before the war trade between Canada and France had been comparatively small. In 1913-14, for example, the exports to France amounted to only \$3,810,562, which was about 2 per cent of the exports to the United Kingdom in that year. The imports from France during the same period amounted to \$14,404,276. It was held that Canadian producers and manufacturers had not made a serious effort to supply the French market with important Canadian products such as wood, cereals, fish, and cheese, and that French purchasers seemed unaware of the Cana-

dian supply of important raw materials. France purchased some of these products in large quantities from other countries. In 1913 France had expended 11,000,000,000 francs on imports of commodities in whose production Canada had especial advantages. A large quantity of French paper, for example, was made from German or Austrian wood pulp, although Canada was rich in both these products. It was the purpose of the mission to make these conditions known in France for it was believed that the insignificance of the commerce between the two countries was due largely to the ignorance of purchasers in each.

**CHARGES OF GRAFT.** Sir Rodmond Roblin, former Premier of Manitoba, together with two members of his cabinet and Thomas Kelly, a contractor, were indicted by the Grand Jury in Winnipeg on charges which included conspiracy to defraud and an attempt to corrupt witnesses. The Premier was also charged with the destruction of public documents and the contractor with perjury and theft. The latter was found guilty on June 29th, but sentence was suspended during the application for a new trial. It was charged in Parliament that middlemen had gained excessive profits through the awards of contracts by the Canadian Shell Committee, and on March 30th, the government announced that a Royal Commission of inquiry would be appointed to investigate the suspected contracts. The commission, consisting of Sir William Meredith of Toronto, and Justice Duff of the Federal Supreme Court, began its inquiry on April 26th. The charge had been made that Lieut.-Gen. Sir Sam Hughes, minister of militia, had been dishonorably involved. He had presented his defense before Parliament on April 18th, disavowing absolutely any such relation and demanding a full inquiry. The commission investigated the charge in general that contracts were awarded to American firms for improper reasons. These awards were explained by the Ordnance Adviser of the Imperial Munitions Board, as due to, in his opinion, first, that Canadian companies were incompetent and could not deliver the supplies in time, and, second, that the matter demanded haste. It was acknowledged that the American firms had not been worthy of his confidence in the matter of delivering the supplies on time. The commission then took up the question of graft in connection with the awards. The counsel for General Hughes presented evidence that he had been entirely free from complicity in "rake offs," and on July 21st the commission declared him innocent of any improper relation to the contracts in question. It criticised Col. J. Wesley Allison, but held that he had no intention of receiving remuneration.

**MISCELLANEOUS.** The Parliament buildings in Ottawa were destroyed by fire on February 3rd. The fire was supposed to have been the work of an incendiary and was attributed by many Canadians to the German sympathizers, but the commission appointed to investigate reported that there was no positive evidence of crime. On February 4th attempts were made to destroy Victoria Bridge at Montreal. On March 7th, Charles Respa, charged with dynamiting the factory at Walkerville and endeavoring to blow up the armory at Windsor, was sentenced to life imprisonment at Sandwich, Ont. Early in the year a law to es-

tablish woman suffrage was passed in Manitoba. A woman suffrage measure was passed also in Alberta and it was announced in Saskatchewan that a similar measure would be introduced. In Manitoba the law to abolish the retail liquor trade was passed. In Newfoundland a vote carried complete prohibition, which was to take effect on January 1, 1917. In British Columbia a plebiscite was held on the question of the liquor traffic, and the result was heavily for prohibition. In the spring the Ontario Legislature passed a law closing all bars and liquor shops in the province and the law came into effect on September 16th. Under its terms liquor could be sold only for certain specified purposes and only under very strict government direction. See CITY PLANNING; EXPLORATION.

**CANALS.** The reopening of the Panama Canal and the successful efforts to deal with the troublesome slides that interfered with its use in 1915 may perhaps be considered closing chapters in that great work and are discussed under that title. (See PANAMA CANAL.) The next work of magnitude was the enlargement of the Welland Canal in Canada between Lake Ontario and Lake Erie, amounting to almost an entire reconstruction and partial relocation, while the completion of the New York State Barge Canal was almost reached. These two projects and others are discussed in the accompanying paragraphs but in the main there was little interest manifested during the year in canal projects, either in Europe or America. The system of canals in Belgium had served that country for defense as it made possible the inundation of large regions, and additional waterways were suggested for construction after the war.

**NEW YORK BARGE CANAL.** At the end of 1916 less than 10 per cent of actual construction remained on the New York State Barge Canal, and the work still undone was not so much excavation or placing concrete as it was the organization of the operating force, the manipulation of the lock gates and valves, maintenance of water supply and reservoirs, generation of electric power, and the creation of terminals and freight handling facilities along the route of the canal and the contributing waterways. In the season of 1916, 83 miles of the Erie section of the canal at the eastern end were completed and open for navigation as were about 97 miles eastward from Buffalo, including sections from Newark to Pittsford and from South Greece to Tonawanda. Unfinished work at the mouth of Tonawanda Creek, the section south of Rochester, the section from Lyons to Clyde, and four miles from Utica to Sterling Creek were the only parts that prevented the full use of the canal. During the year the State Engineer had solved the last big engineering problems, chief of which were the Rochester and Syracuse harbors, the Irondequoit crossing, the Tonawanda movable bridges, 20 disputed railway crossings, and the Clyde River location, all of which were put under contract. The opening of the full barge canal system was looked for in 1918.

**LAKE WASHINGTON CANAL.** Progress continued on this short but important waterway at Seattle, Wash., so that it was thought it could be opened for traffic in 1917 or 1918. On July 12th the mammoth gates dividing the

fresh water of Salmon Bay from the salt water of Shilsole Bay were closed, so that Salmon Bay above the locks could be filled to the level of Lake Union, the water being raised about 30 feet above the previous level at low tide. In the following month the large concrete lock at the entrance to Salmon Bay was formally opened for traffic by Lieut.-Col. J. B. Cavanaugh, U. S. A., engineer in charge. This main lock is of concrete, 825 feet long, 80 feet wide, and at the Salmon Bay end opens into a channel 36 feet deep. The walls of the lock are 55 feet thick at the bottom, 8 feet thick at the top, and 55 feet high. When the lock is emptied and the water brought down to the mean level of Puget Sound the water inclosed by its walls has a depth of 36 feet; when it is full, or raised to the level of Salmon Bay, the water has a depth of nearly 50 feet. Only eight minutes are required to empty or fill the big basin. At high tide there is only 8 or 9 feet difference between the level of the salt water in the outer channel and that of the fresh water basin at Salmon Bay. In addition to the main lock there is a small lock alongside the large basin 150 feet long and 30 feet wide, which can take vessels of 16-foot draft. Naturally its gates are much lighter than those of the big basin, and it is designed for the rapid lockage of small craft.

The actual completion of the canal was more or less complicated by the Seattle bridge situation which interfered somewhat with the remainder of the dredging operations. In October the Fifteenth Avenue Bridge at Salmon Bay was 85 per cent finished and was to be completed by the following April. The Fremont Bridge was 90 per cent completed and was expected to be ready early in 1917. The Latona Bridge across Lake Union was delayed by reason of certain technical investigations concerning the foundations. However, if the work was executed according to the contract the Latona Bridge would not be finished before Jan. 1, 1918, and would therefore seriously affect the date on which navigation might be inaugurated between Lake Union and Lake Washington. The work of constructing this new canal was begun on Nov. 10, 1911, and up to 1916 Congress had appropriated for it \$2,275,000, while to this amount \$1,000,000 was added by the State of Washington and King County. It has been described in earlier issues of the YEAR BOOK and a technical description may be found in *Engineering Record* for July 31, 1915.

**CANALS AT SAULT STE. MARIE.** The lake commerce passing through the canals at Sault Ste. Marie, Michigan, and Ontario, showed a substantial gain in 1916 over the previous year and a record for traffic in the history of these busy waterways. At the United States canal the masonry work on the new fourth lock was about one-half completed on December 31st, but no work had then been started on the gates or machinery. The season of 1916 for the United States canal, 244 days, opened April 20th, and closed December 19th, while the Canadian canal was open from April 18th to December 18th, 245 days. In this time 25,407 vessels with a registered net tonnage of 69,824,463, passed through both canals, 18,716 using the United States canal and 6691 the Canadian, the registered tonnage being 57,038,207 for the American and 12,786,256 for the Canadian. This was an

increase of 4174 vessels, or 20 per cent, over the total traffic for 1915 when 21,233 vessels with a total tonnage of 56,399,147 passed through. The total freight in 1916 was 91,888,219 short tons as compared with 71,290,304 in 1915. The most important items as usual were iron ore, of which 63,423,180 tons passed through the canals, and wheat, of which there were 226,063,315 bushels, a decrease of 29,418,243 bushels from 1915.

**ABANDONED CANALS IN THE UNITED STATES.** Canal transportation in the United States, while often serving useful purposes for a time, in many cases has grown obsolete or inadequate and the canals have been abandoned. In cities they became quite often as obnoxious as open sewers, or occupied valuable space in busy areas. Accordingly there was developed a tendency in several cities, after draining, to use the deep cuts of the canals for rapid transit or railways. Thus in Cincinnati the proposed interurban entrance was located on the Miami and Erie Canal. In Syracuse it was thought that the old Erie Canal bed would certainly in time become the route of the New York Central through the city and replace the tracks which were for years a most disgraceful example of municipal disfigurement. In Rochester, with the turning of the Erie Canal into new channels, the use of its bed for a street railway route there would be made possible. In several other communities containing abandoned canals in their limits, the combined advantages of ridding the city of a nuisance and of obtaining ready made a depressed railway terminal or rapid transit route were being seriously canvassed.

**WELLAND CANAL.** Active work on this vast enterprise was in progress in 1916 though the war and the scarcity of labor in Canada interfered with its most vigorous prosecution. The lock construction involving structures from 800 to 2500 feet in length unquestionably rivaled that of Panama, while the entire canal was laid out as a single piece of work, although actually divided into nine distinct contracts ranging up to \$10,000,000 each in cost. The rock excavated on one of the sections is crushed and used for aggregate for most of the large structures which are located at the north end of the canal. This stone is distributed as well as the spoil from the steam shovel excavation by a double track stone ballasted railway along the west side of the canal. Considerable use was being made of traveling rehoisting towers for placing the concrete and advantages were claimed over handling large buckets of concrete with cranes and derricks and over direct chuting from a central plant. The canal was being built under the charge of the Department of Railways and Canals of the Canadian government with J. L. Weller engineer in charge of the work. The general work and methods are discussed in *Engineering Record* for Oct. 21, 1916.

**MARSEILLES-RHÔNE CANAL.** Notwithstanding the war, progress continued on this important waterway with its notable tunnel. (See TUNNELS.) One of the three opening galleries of the Rove tunnel was completed the entire length (23,622 feet). The portion above the tow-path was finished on half of the length. The canal ditch in the tunnel had not been begun. Between Marseilles and Port-de-Bouc the breakwaters in the Mediterranean and in the Etang de Berre were almost completed, while between

Port-de-Bouc and Arles, the work begun before the war was being continued. The locks at Arles on the Rhône were built. The total cost of the canal was estimated at \$17,755,000, including \$10,815,000 for the Rove tunnel and its approaches.

**GERMAN CANALS.** In the early part of 1916 the Mittelland (Rhine-Elbe) Canal Commission held a very largely attended meeting at Berlin to discuss the continuation of the canal from the Weser and Hanover farther east to the Elbe, two routes being considered: The northerly route would run almost straight east to Heinrichsberg on the Elbe below Magdeburg; the southerly route would reach Magdeburg via Peine, Braunschweig, and Oschersleben. The northerly canal would have a length of 89 miles and few locks, and would cost some \$25,000,000, while the southerly canal would be 107 miles in length and would cost nearly \$35,000,000, but it possessed the advantage of traversing important industrial districts and would be nearer water-feeders from the Harz Mountains. A third suggestion was to place the terminal farther south on the Elbe above Magdeburg. The new canal would be designed for through traffic, especially if in any case branch canals would be constructed. It is interesting to note that the northerly route was considered less exposed to aerial attacks. No decision was reached as to which route would be selected, but an early construction of the canal was urged upon the government.

**CANARY ISLANDS.** A group of islands off the northwest coast of Africa; a province of Spain. Area, 7273 square kilometers (2808 square miles). The census of Dec. 31, 1910, returned a population of 444,016; estimate of Dec. 31, 1913, 460,768. The capital, Santa Cruz de Tenerife, had 63,004 inhabitants in 1910; Las Palmas, the most important town, had 60,338. See **AGRICULTURE**.

**CANCER.** What appears to be important evidence in favor of the parasitic origin of cancer is being developed by E. F. Smith of the Laboratory of Plant Pathology of the United States Department of Agriculture, who has, for a number of years, been studying a growth occurring in many plants and known as "crown-gall." This is a vegetable tumor which is in many of its characteristics analogous to cancer in man. The points of similarity which have been brought out by Smith are the vegetative or embryonic character of the cells, rapidity of growth, lack of capsule and infiltration of surrounding tissue, a tendency to central degeneration, liability to recurrence after removal, cachexia, and the tendency to develop metastases. An organism has been found and isolated, named the *Bacterium tumefaciens*, which fulfills Koch's postulates for a specific organism. Growths similar to the tumor from which the bacterium was derived have been produced by inoculation, but even more interesting experiments appear to indicate that tumors resembling sarcoma, carcinoma, epithelioma, teratoma, and mixed tumors can be produced by the same organism, according to the part of the plant and the age of the plant inoculated. When the bacterium is introduced into the connective tissue of young, well nourished, actively growing plants, sarcoma results. Carcinoma and epithelioma develop when epithelial tissue is inoculated. When inoculation is made in

the vicinity of growing buds embryomata or teratomata are produced, containing all the primary germ layers, which become scattered and separated into fragments, which are distributed in the new growth where they develop abortively. Smith explains the action of the organism thus: "The micro-organism, entering the cells as the result of slight wounds, grows rapidly for a short time. Its growth is then inhibited apparently by its own by-products. As the result of this inhibition many of the bacterial rods swell, becoming clumpy and variably branched, giving rise to the so-called Y bodies. There then ensues death for many, and a dormant period for the remainder. The organisms which are killed outright by the by-products evolved during their previous growth in the cells, are the ones which now stimulate the nucleus to development. This I conceive to take place by endotoxins or other substances. As soon as the nucleus begins to divide, its membrane disappears, and its contents flow into the cells, the benumbed bacteria take on new growth, and pass over into the daughter cells, where the process is repeated."

Probably the most interesting feature of this investigation is the possibility it suggests that the several varieties of malignant tumors in man may have a common origin.

#### **CANNING FRUIT AND VEGETABLES.**

See **HORTICULTURE**.

**CANNON, JAMES GRAHAM.** An American banker, died at Golden's Bridge, N. Y., July 5, 1916. He was born at Delhi, N. Y., in 1858, and at 18 became a messenger in the Fourth National Bank of New York City. With this institution he was connected for almost 40 years (for 20 years as vice-president), retiring finally as its president, an office to which he was elected in 1910. Mr. Cannon helped to organize, and was president of, the National Association of Credit Men. He devoted much attention to the subject of clearing houses, his work called *Clearing Houses—Their History, Methods, and Administration* being the chief authority in its field. He advocated the use of the Clearing House Association of the country as a basis for the issue of an elastic currency, when necessitated by trade conditions, and proposed that clearing houses be incorporated. Besides his interest in the Fourth National Bank, Mr. Cannon was an officer or director of numerous other banks and also of manufacturing concerns. He identified himself prominently with the New York Chamber of Commerce, with movements for civic and suburban improvement, and with various philanthropies and educational institutions. A member of the National Committee of the Y. M. C. A., he stood back of evangelistic campaigns conducted by this organization in 1910, in 90 large cities and in rural districts.

**CAPE COLONY.** Formerly the popular name of the Cape of Good Hope Colony, which, as Cape of Good Hope Province, became an original part of the Union of South Africa, May 31, 1910. See **SOUTH AFRICA, UNION OF**.

**CAPE OF GOOD HOPE PROVINCE.** An original province of the Union of South Africa. (See **SOUTH AFRICA, UNION OF**.) Capetown, the capital, had, with suburbs, at the last census, 161,579 inhabitants (municipality, 67,159).

**CAPE-TO-CAIRO RAILWAY.** See **CONGO, BELGIAN**.



**CAPE VERDE ISLANDS.** A group of Portuguese West African islands, having a total area of 1516 square miles. Population (1912), 143,929. Capital, Praia.

**CAPPER, ARTHUR.** Reflected Republican Governor of Kansas Nov. 7, 1916.

**CARBIDE.** See CHEMISTRY; INDUSTRIAL.

**CARDINALS, NEW.** See ROMAN CATHOLIC CHURCH.

**CARINTHIA.** A crownland of Austria. See AUSTRIA-HUNGARY.

**CARLISLE INDIAN SCHOOL.** See INDIAN TRAINING AND INDUSTRIAL SCHOOL.

**CARLSTROM, VICTOR.** See AERONAUTICS.

**CARMEN SYLVA.** See ELIZABETH, DOWAGER QUEEN OF RUMANIA.

**CARNEGIE, VOYAGES OF THE.** See EXPLORATION, *Miscellaneous*.

**CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE.** See INTERNATIONAL PEACE AND ARBITRATION.

**CARNEGIE FOUNDATION FOR THE ADVANCEMENT OF TEACHING.** See UNIVERSITIES AND COLLEGES, section so entitled.

**CARNEGIE GEOPHYSICAL LABORATORY.** See CHEMISTRY, GENERAL; MINERALOGY.

**CARNEGIE INSTITUTE OF TECHNOLOGY.** A non-sectarian institution for the technical education of men. It was founded by Andrew Carnegie at Pittsburgh, in 1909. The institute comprises schools of Applied Design, Applied Science, and Applied Industries, and the Margaret Morrison Carnegie School. In the fall of 1916 the total enrollment of students was 3628. The faculty numbered 233. For the fiscal year ending March 30th the endowment was \$9,150,000, and in 1915-16 the income was \$672,203. At the end of the year construction work was about to begin on a new \$300,000 building for the School of Applied Science, to house the executive offices and library of the Engineering School and the departments of Machine Construction and Commercial Engineering. The library contains 350,000 volumes. President, Arthur A. Hamerschlag. See also PAINTING AND SCULPTURE.

**CARNEGIE INSTITUTION OF WASHINGTON.** The fifteenth annual report of the president of the Institution, Robert S. Woodward, covers the fiscal year ending Oct. 31, 1916. It considers in a general way the accomplishments of the Institution in its various departments: botanical research, economics and sociology, embryology, experimental evolution, historical research, marine biology, meridian astronomy, terrestrial magnetism, geophysical laboratory, nutrition laboratory, division of publication, and solar observatory. Total receipts amounting to \$1,351,200 and appropriations of \$1,334,572 were announced. Emphasis was laid on the fact that within the limits of its annual appropriation each department has complete autonomy. A popular idea that the Institution is wealthy was discredited and the statement made that its research enterprises were restricted by lack of funds. During the year two trustees, William N. Frew and Seth Low (q.v.), and a research associate, Prof. Harry Clary Jones (q.v.), died.

During the past year the new 100-inch reflecting telescope for the Mount Wilson Solar Observatory was virtually completed. It was expected that the parts would be assembled in

1917. Its installation will give the observatory an unrivaled equipment for most branches of stellar work. The department of terrestrial magnetism and the geophysical laboratory reported that the nonmagnetic ship *Carnegie* left Dutch Harbor, Alaska, Aug. 7, 1915, and left Lyttleton, New Zealand, December 6th for a voyage around the world (17,084 nautical miles), accomplished in 118 days. Up to May, 1916, the publications of the geophysical laboratory numbered 240. As a result of the joint researches of the late Dr. C. H. F. Peters, astronomer of Hamilton College, and Mr. Edward B. Knobel, past president of the Royal Astronomical Society, London, the Institution published in 1916 a new edition of Hipparchus's great catalogue of stellar positions, edited by Ptolemy and since known as *Ptolemy's Almagest*. Dr. Frederic E. Clements, an associate attached to the department of botanical research, wrote an important book entitled *Plant Succession: an Analysis of the Development of Vegetation*. Other notable books published under the auspices of the Institution include: the eighth and last volume of Dr. H. Oskar Sommer's edition of the Vulgate Version of the Arthurian Romances; concordances to Spencer, Keats, and Horace; and a new edition of *The Old Yellow Book*. Prof. J. B. Scott has edited eight volumes in "Classics of International Law." Victor S. Clark wrote a *History of Manufactures in the United States (1607-1860)*. During the year the Executive Committee authorized the publication of 23 volumes at an estimated cost of about \$60,000. In 1916, 35 volumes were issued, as contrasted with 3 volumes in 1902, and 24 additional volumes were in press. Since the foundation of the Institution there have been distributed by gifts to libraries and authors, and by sales, 159,908 volumes.

**CAROLINE ISLANDS.** A group of islands lying north of New Guinea and forming a dependency of the German New Guinea Protectorate (q.v.), but occupied by British troops in 1914. Area (Caroline, Palau, and Mariana or Ladrone Islands, excepting Guam), 307 square miles; population, about 55,000; white population (1913), 264 (of whom 154 Germans). Capitals, Ponapé and Yap.

**CARPENTER, LOUIS HENRY.** An American soldier, died in Philadelphia, Jan. 31, 1916. Born at Glassboro, N. J., in 1839, he graduated A.B. from the Central High School of Philadelphia in 1856, and later studied at the University of Pennsylvania. He fought throughout the Civil War, rising from private to brevet-colonel of volunteers, and afterwards he received a captain's commission in the regular army. For 13 years he served on the Indian frontier, particularly distinguishing himself in 1868, when he marched 70 miles to the relief of General Forsyth, besieged by the Indians on the Republican River in Kansas. Afterward General Carpenter commanded various Western forts, and in 1896 was president of the board to revise cavalry tactics. In the Spanish-American War he held the rank of brigadier-general of volunteers; during 1898-99 he served as military governor of the Province of Puerto Principe. In the latter year he was retired, after promotion to brigadier-general, U. S. A. For his services during the Indian campaigns, the Congressional Medal of Honor was awarded to him in 1898.

**CARRANZA, VENUSTIANO.** See MEXICO, *History*.

**CARREL, ALEXIS.** See DAKIN'S SOLUTION; SURGERY; ROCKEFELLER PHILANTHROPIC BOARDS, *Rockefeller Institute and Rockefeller Foundation*.

**CARRENO, TERESA.** See MUSIC, section *Artists*, *Instrumentalists*, and section *Germany*.

**CARSON, SIR EDWARD.** See GREAT BRITAIN, *History*.

**CARTER, JAMES M.** See PENOLOGY.

**CARTY, JOHN J.** See ACADEMY OF SCIENCES, NATIONAL.

**CARVAJAL, FRANCISCO HENRIQUEZ Y.** Proclaimed President of the Dominican Republic, July 26, 1916. See DOMINICAN REPUBLIC.

**CASASUS, JOAQUIN D.** A Mexican lawyer, financier, and diplomat, died in New York City, Feb. 25, 1916. He was born in the State of Tabasco, Mexico, in 1859, studied at the universities of Yucatan and Mexico, and practiced law. At 28 he attended, as a delegate appointed by President Diaz, the Military Congress at The Hague. At various times he was dean of the law and commercial departments of the University of Mexico and president of the Banco Central Mexicano. In 1905 he was appointed Ambassador to the United States, an office which he held during the administrations of Presidents Roosevelt and Taft. Señor Casasus, at the time of his death, was engaged in law practice in New York. He was known as a writer on financial and literary subjects, and had translated seven volumes of English classics into Spanish. Recognition of his work came to him from the literary societies of Mexico and Spain.

**CASEMENT, SIR ROGER DAVID.** An Irish conspirator, hanged Aug. 3, 1916, in Pentonville Jail, London, for high treason. His activities culminated in a sensational effort to prepare for and assist the Sinn Fein revolt against British rule that broke out in Dublin in April, 1916. For some months he had been in Germany, and his known desire to see Ireland freed from English control led to a general belief that he was plotting to get German aid for his plans, or to help Germany in the great war. It was reported that the British government had set a price for his capture. On April 21, 1916, he was captured in Ireland, after landing at Tralee from a German submarine. The submarine was accompanied by a German tramp steamer carrying a cargo of arms, to be used in the revolt, but it was blown up when capture by British war vessels was imminent. Casement was taken to London, and was tried in the High Court before the Lord Chief Justice (Lord Reading), two other justices, and a jury. The indictment, based on the Treason Act of 1351, charged the prisoner with "adhering to the King's enemies elsewhere than in the King's realm, to wit, in the Empire of Germany." Sir Roger's activities in Germany came prominently before the court. It was charged that he had endeavored, by various means, to persuade Irishmen, who had been fighting for Britain and had been captured by Germany and imprisoned at the Limburg camp, to join an Irish brigade. This brigade was to be equipped by the German government, and at some time was to be sent to Ireland in an effort for independence. Sir Roger, whose trial began June 26th, pleaded not guilty, and also denied that he had taken any bribe from Ger-

many or had given any aid to Germany against England. On June 29th he was found guilty as charged, and was sentenced to be hanged. After the jury brought in their verdict, Casement read a long and eloquent statement in his own defense, stating that in being tried by an English jury he did not consider that he had had trial by his peers; that he had not sought directly to injure England, but rather to perform a patriotic service to the country which he considered his own, Ireland. He maintained a remarkable composure. Daniel J. Bailey, an Irishman who accompanied Casement in the submarine, was tried with him, but was freed, evidence having been produced that he returned to Ireland expecting to reenlist in the British army. The case for the Crown was conducted by the Attorney General, Sir F. E. Smith, and for Casement by Sergeant Sullivan, a brilliant Irish barrister, who, after an impassioned defense of Sir Roger, collapsed.

Between the time of conviction and the execution, many efforts were made to have the sentence mitigated. Appeals were taken without effect. A group of British authors signed a petition, and feeling among Irish-Americans was so strong that a resolution was passed by the United States Senate and sent to the British government, urging that leniency be shown. The government argued that only as a matter of policy, as a concession to the feelings of many Irishmen then fighting on the Continent for England, could it interfere with the action of the court; and such a motive it could not consider. Public opinion in England generally held that death was the just penalty for treason at such a time; the *London Daily News*, however, considered the government's position unwise.

Sir Roger Casement was born Sept. 1, 1864. From 1895 to 1913 he was engaged in the British consular service, after a three years' connection with the Niger Coast Oil Rivers Protectorate. By 1898 he had become consul for the Portuguese Possessions in West Africa, south of the Gulf of Guinea. For special services in Cape Town in 1899 and 1900, during the war in South Africa, he was given the Queen's medal. Later he distinguished himself by exposing the treatment of natives in King Leopold's Congo State. In 1905 he was made a C.M.G., the next year became consul for the state of São Paulo, Brazil, and in 1908 was transferred to Para. In 1912, while consul general at Rio de Janeiro, an office from which he retired on a pension in 1913, he became widely known for his investigations of the cruelties practiced on natives of Putumayo by a British rubber company. In 1909 he had been knighted. His pension he gave up when he went to Germany in behalf of the Irish cause, and after the exposure of his activities he was deprived of knighthood. At various times he visited the United States, and recently had been there to raise funds for the Irish Volunteers. After his death, an American friend, Mr. John Quinn, published an article in which he discussed Casement's attitude toward the British government. Sir Roger, like other Irishmen, considered that Ireland had been betrayed by the refusal to put the Home Rule Bill into immediate operation, and that Sir Edward Carson and other leaders of the Ulster revolt, who escaped punishment, were traitors for the sake of a sec-

tion of Ireland and were inspired by English Tories, while he was ready to work for all Ireland against England from the highest motives of patriotism.

**CASE SCHOOL OF APPLIED SCIENCE.**

A non-sectarian, technical school at Cleveland, Ohio, founded in 1881. There were 551 students in the fall of 1916 and besides 57 faculty members there were 17 special lecturers. The productive funds were \$2,458,788 and the total income, \$206,513. The library contains 13,505 volumes. President, Charles Sumner Howe.

**CATERPILLAR TRACTOR.** See **MILITARY PROGRESS.**

**CATHOLIC CHURCH.** See **ROMAN CATHOLIC CHURCH.**

**CATHOLIC UNIVERSITY OF AMERICA.**

A Roman Catholic institution for higher education, at Washington, D. C. Founded in 1887, it is the national university of the Church, and gives the higher degrees as well as several baccalaureate degrees. In the fall of 1916 there were 560 students in the schools of the university (schools of the sacred sciences, law, philosophy, letters, and sciences), 453 in affiliated colleges, and 600 in summer schools, a total of 1613. The faculty numbered 80. The productive funds of the institution amounted to about \$1,833,870, from which a revenue of about \$212,380 was obtained. At the end of the year the library had 103,000 volumes. President, Rt. Rev. Thomas Joseph Shahan.

**CATLIN, ISAAC SWARTWOOD.** An American soldier and lawyer, died Jan. 19, 1916, in Brooklyn, N. Y. He was born at Owego, N. Y., in 1835, and when 25 years old was mayor of this town. In 1861 he raised a company of volunteers, of which he became captain, and distinguished himself at the battle of Big Bethel. Later, as lieutenant-colonel and colonel of the 109th New York Volunteers, he fought in most of the battles from the Wilderness to the fall of Petersburg. At Petersburg, in spite of two wounds, one of which shattered his right leg, he was carried at the head of his troops who captured certain unexploded mines. This exploit brought him the Congressional medal of honor. In 1864-65 he was president of a court martial in Washington. At the close of the war he received brevets of brigadier-general and major-general of volunteers. General Catlin returned to Owego, where he was elected district attorney of Tioga County. Later, after his removal to Brooklyn, where he established himself in law practice with Gen. Benjamin F. Tracy, he was elected (1871) United States district attorney for the Eastern District of New York. From 1887 to 1893 he served as district attorney of Kings County. During the Spanish-American War he visited Cuba and the Philippines and wrote on conditions in these islands; he prepared memoirs which were to be published after his death.

**CATSKILL AQUEDUCT.** See **AQUEDUCT.**

**CATTLE.** See **DAIRYING; LEATHER; STOCK RAISING AND MEAT PRODUCTION; VETERINARY MEDICINE.**

**CATTS, SYDNEY J.** Elected Prohibition Governor of Florida Nov. 7, 1916.

**CAVALRY.** See **MILITARY PROGRESS.**

**CAYENNE.** See **FRENCH GUIANA.**

**CELEBRATIONS.** Among the more important celebrations that occurred during the year were the following:

**NEWARK.** On May 17, 1866, a band of men, women, and children landed on the banks of the Passaic River, N. J., and started a settlement that has grown into the city of Newark, ranking 14th among the cities of the United States, with a population of nearly 400,000. In 1913 Jacob Haussling, mayor of Newark, suggested in his annual message the celebration of Newark's 250th anniversary, and on April 3, 1914, subsequent to suitable legislation, he was authorized to appoint a committee of 100 residents to prepare plans and conduct the celebration. Franklin Murphy became chairman of this committee, and its first meeting was held on July 11, 1914, after which a number of committees undertook the preparation of the celebration. A fund of \$250,000 was raised among the citizens, and *The Newarker*, a monthly publication, began its series of 12 issues on Nov. 1, 1915. Among the preliminary events was a poster exhibit to which 230 posters from 163 artists were shown, and prizes of \$1000, \$500, and \$300 were given to the best original designs offered. (See the *Newark Poster Catalogue*, 1915.) Also a poem competition was authorized and prizes of \$250, \$150, \$100, and ten of \$50 each were offered. Over 900 manuscripts were received, and a volume of the better poems is announced for publication. The celebration began on May 1, 1916, and continued until November 1st, with a continuous series of interesting events, of which only the more important can be mentioned. The formal exercises began on May 1st, with a military parade in the morning, the historic ceremonies with addresses in the afternoon, and the first of six musical festivals in the evening. On May 10th occurred the unveiling of a tablet to the honor of the Founders of the First Congregational Church and the dedication of three civic monuments at Puritan Landing Place, Branford Place, and at the Public Library; also the unveiling of a tablet marking the site of the parsonage of Dr. Aaron Burr. Three days later Newark's Industrial Exposition was inaugurated by President Wilson, and the Robert Treat Hotel was opened. Founders' Day was celebrated on May 17th, with a parade followed in the afternoon by special religious and historic ceremonies in the First Presbyterian Church. The most spectacular event was the Newark Historical Pageant, given on the evenings of May 30th, 31st, June 1st, and 2nd, in Weequahic Park, in which 3500 persons in costume participated. The audiences were from 52,000 to 70,000 and were the largest in the history of New Jersey. (See *The Book of Words. The Pageant of Newark*, by Thomas Wood Stevens, 1916.) On July 26th occurred the formal unveiling of the Colleoni equestrian statue by Verrocchio of which a bronze replica by J. Massey Rhind was presented to Newark by Christian W. Feigenspan. Other events included numerous parades, some of which were at night, and consisted of floats showing historic occasions as well as the special industries of the city. Also there were many congresses, conventions, and gatherings of different kinds, as well as various athletic and sport meetings, notably on September 8th, 9th, and 10th, of the Amateur Athletic Union, at which six new records were made (120-yard hurdles, 14 $\frac{3}{4}$  sec.; 880-yard run, 1 min., 54 sec.; 220-yard hurdles, 24 sec.; 440-yard hurdles, 54 $\frac{3}{4}$  sec.; discus throwing, 145 ft., 4 $\frac{1}{2}$  in.; javelin

throwing, 190 ft., 6 in.). A memorial building to cost \$1,500,000 will be built, a commemorative medal was struck, a flag for the city of Newark chosen, and a memorial volume descriptive of the celebration is in course of preparation.

**INDIANA.** On Dec. 11, 1816, Indiana was admitted to the Union as the 19th State and the 6th after the original 13. The celebration of this important event—the centennial of the State—was placed by the Governor under the general guidance of the Indiana Historical Commission. County and local celebrations were encouraged, but the principal efforts of the commission in cooperation with Indiana University and certain private citizens were concentrated on three great and historic pageants. The first of these, the Pageant of Bloomington and Indiana University, presented the educational development of the State as focused in that community and served by the university. It was given on the campus of the university in Bloomington on May 16th, 17th, 18th, and 20th. The second was the Pageant of Corydon, the pioneer capital of Indiana, and gave the drama of the preëminence of the town at the time when for 12 years it was the territorial and State capital. It was held in front of the old State capitol in Corydon, June 2nd and 3d. The final and culminating one of the series was the Pageant of Indiana and depicted the development of the State as a community from its exploration by La Salle to the centennial of its admission to the Union. It was given in Riverside Park, Indianapolis, during October 2nd–8th. These pageants were dramas in the strictest sense of the word, not processions, and were performed complete every day on grounds that were historic and characteristic of the community life there presented. The dramas of these three pageants were written by and presented under the direction of William C. Langdon, by whom also the words have been published. In the first of these pageants was sung the "Hymn to Indiana," written by Mr. Langdon and set to music by Charles D. Campbell, which has received very general approval throughout the State. In these pageants a design for a State flag was presented which has been officially accepted. In Indianapolis the celebration began on October 2nd, with a parade of civic, patriotic, and fraternal organizations. Also there was held in the Herron Art Institute an exposition of fine and domestic arts, the product of Indiana for the last 100 years. Home-coming day was celebrated on October 3d. A number of the counties also had pageants in their celebrations, notably Earlham College, Fort Wayne, South Bend, Crawfordsville, and Vincennes, while Peru had an outdoor Indian drama, as the development of the community was not the subject. The celebrations also included a widespread observance of Indiana Products Day and a general home-coming which was stimulated by the publication of a pamphlet under the editorship of George Ade and including contributions from James Whitcomb Riley and other prominent Indiana writers.

**OTHER CELEBRATIONS.** The forthcoming celebrations at Gulfport, Miss., San Antonio, Texas, and Plymouth, Mass., with proposed expositions, are described under **EXPOSITIONS**. See also **AMERICAN BIBLE SOCIETY**; **DRAMA**; **LITERATURE**,

**ENGLISH AND AMERICAN**; **RUTGERS COLLEGE**; **SPANISH LITERATURE**; **YALE UNIVERSITY**.

**CELTIC PHILOLOGY.** See **PHILOLOGY**, **MODERN**.

**CEMENT.** The total quantity of Portland, natural, and puzzolan cement marketed or shipped from the mines in the United States in 1915, was 87,685,222 barrels, valued at \$75,155,102, as compared with 87,257,552 barrels, valued at \$80,533,283, in 1914. This was an increase of about 5 per cent in quantity and a decrease of about 7 per cent in value. The cement marketed or produced included 86,891,681 barrels of Portland cement, 750,863 of natural cement, and 42,678 of puzzolan cement. The largest amount of Portland cement is produced in Pennsylvania, where in 1915 38,648,941 barrels were produced. Other States producing in the order named are Indiana, Illinois, New York, Michigan, Missouri, Iowa, California, Kansas, and Ohio. The natural cement is produced in largest quantities in New York, Illinois, Indiana, Ohio, Pennsylvania, Kansas, and Minnesota. The total quantity produced in 1915 was 750,863 barrels, valued at \$358,672. Puzzolan is produced in Alabama, New York, Ohio, and Pennsylvania. The total production in 1915 was 42,678 barrels, valued at \$39,801.

The total export of cement in the United States in 1915 was 2,565,031 barrels, valued at \$3,361,451.

The shipments of Portland cement from the mines in 1916 approximated 94,508,000 barrels compared with 86,891,681 barrels in 1915, an increase of 8.8 per cent. The production of Portland cement approximated 91,194,000 barrels compared with 85,114,907 barrels in 1915. The year holds the record for shipments of Portland cement. High prices prevailed throughout the United States except at a few points. Six, new plants reported production during the year, one each in California, Minnesota, New York, Oklahoma, Oregon, and Texas.

**CEMENT SPECIFICATIONS.** After several years' work a joint conference committee representing the United States government, the American Society for Testing Materials, and the American Society of Civil Engineers finally reported in favor of a single standard cement specification for the United States. The principal change was the increase of fineness from 75 to 78 per cent for passage through the 200-mesh sieve. No change was made in the test for constancy of volume, while for determining the time of setting either the Gillmore needles or the Vicat apparatus may be used. The report was accepted at the annual meeting of the American Society for Testing Materials and the specifications were adopted to become effective Jan. 1, 1917, by a letter ballot.

**POTASH AS A BY-PRODUCT IN CEMENT MANUFACTURE.** During the year the first plant to use the Cottrell fume precipitation process for the recovery of potash as a by-product in Portland-cement manufacture was put into successful operation at the works of the Security Cement and Lime Co., near Hagerstown, Md. The process consists of passing the dust-laden gases from the kilns through an intense electrostatic field where the dust is precipitated on the positive and negative electrodes, the method being essentially the same as in the attraction of the pith ball by electrified rubber or glass. The project naturally involved the installation

of generators and transformers capable of stepping up the current to 70,000 volts and the provision of adequate insulation and suitable electrodes. With two kilns 7 x 100 feet and three kilns 8 x 125 feet, the production of potash dust averaged from 20 to 25 tons per 24-hour day, and this contained from 5 to 10 per cent pure K<sub>2</sub>O present in the form of potassium sulphate and equivalent to approximately 10 to 20 per cent of the sulphate. The dust being finely divided is highly desirable for use as a fertilizer. In addition to the recovery of potash, the process has a beneficial effect on the production of cement, increasing the cement clinker and the fuel economy of the kilns. Consult *Engineering News*, Dec. 28, 1916. See CONCRETE.

**CENTRAL AMERICA.** The name commonly applied to that portion of North America which comprises the republics of Guatemala, Honduras, Salvador, Nicaragua, and Costa Rica, and the colony of British Honduras. See these titles. According to some authorities, Central America includes all the territory between the Isthmus of Panama and the Isthmus of Tehuantepec; according to others, it extends from Colombia to Mexico.

**CERIUM.** See CHEMISTRY, INDUSTRIAL.

**CERVANTES TERCENTENARY.** See SPANISH LITERATURE.

**CEYLON.** An island in the Indian Ocean, south of India, with an extreme length of 266 miles and greatest width 140½ miles; a British crown colony. The capital is Colombo. Area, 25,332 square miles; population, according to the census of March 10, 1911, 4,110,367. More than half the people (2,474,393) are Buddhists. The city of Colombo has 213,398 inhabitants; Negombo, 13,152; Moratuwa, 27,253; Kalutara, 13,006; Kandy, 30,148; Jaffna, 40,539; Galle, 40,187; Matara, 13,851; Batticaloa, 10,715.

Commercial and financial statistics appear below, in rupees (total trade and trade with the United Kingdom; total shipping and British shipping):

	1912	1913	1914
Imports	181,999,991	199,640,797	176,967,156
Imports, U. K.	50,999,044	58,199,628	51,504,240
Exports	198,954,902	234,868,554	219,374,046
Exports, U. K.	97,756,191	105,612,743	115,558,829
Revenue	50,156,329	52,476,416	.....
Expenditure	49,277,370	55,494,754	.....
Shipping*	15,420,142	15,811,073	14,272,694
Shipping Br.	10,114,485	12,313,392	9,403,108

\* Tonnage entered and cleared.

Public debt, Dec. 31, 1914, Rs. 106,024,325. The railways are all owned and operated by the government.

The length of railway open for traffic in Ceylon Sept. 30, 1915, was 692½ miles, as against 672 miles at the corresponding time of 1914, the increase being due to the opening of a section of a line to Chilaw. The rolling stock had increased by 18 new passenger and 186 new goods vehicles, including a number of tank wagons, while the total expenditure to the close of September, 1915, including additional accommodation and improvements, amounted to £7,858,452. The Chilaw line was approaching completion in 1915, and it has been opened to Kochchikade for all descriptions of traffic. Progress had been made with the Pelmadulla

and Badulla extensions, especially on sections between Ratnapura and Dela and between Bandarawela and Ella. Work was in progress on Colombo station extension, and earthwork was in hand on a main line double track between Ragama and Veyangoda. A survey from Chilaw to Puttalam had commenced, and a survey connecting the harbor line with the railway, via Mutwal, was completed.

**CHAMBERLAIN, SAMUEL SELWYN.** An American journalist, died in San Francisco Jan. 25, 1916. Son of a noted newspaper man, Ivory Chamberlain, he was born at Walworth, N. Y., in 1851. After his graduation from New York University in 1871, he was successively on the staffs of the Newark *Advertiser*, the New York *Herald*, and the New York *World*, until 1881, when he was called to the *Evening Telegram*, one of James Gordon Bennett's papers, as managing editor. As private secretary to Mr. Bennett, Mr. Chamberlain traveled extensively in Europe. After 1889, except for one year, he was connected with the Hearst publications, first as editor of the San Francisco *Examiner*, and later in executive capacities on the New York *Evening Journal*, the *American*, the *Cosmopolitan Magazine*, and the Boston *American*, of which he was the publisher at the time of his death.

**CHAMORRO, EMILIANO.** Elected President of Nicaragua Oct. 2, 1916. He was unopposed. Chamorro had been prominent for some years as a conservative leader. See NICARAGUA.

**CHANNEL TUNNEL.** See TUNNELS.

**CHARITIES.** The year 1916 was not notable in charitable activities on account of any spectacular gifts but nevertheless probably exceeded any preceding year in the volume of funds devoted to philanthropic purposes. The total was estimated at fully one billion dollars, or nearly twice that of 1915. There were no new large foundations (see GIFTS) but the work of the Rockefeller Foundation (see ROCKEFELLER PHILANTHROPIC BOARDS), Russell Sage Foundation, and others less comprehensive reached many lines of activity. The most prominent feature of the world's charity during the year was the continuance and the expansion of the work in behalf of various classes of victims of the European war as described under RELIEF FOR WAR VICTIMS. In the United States the remarkable industrial prosperity of the year not only removed the worst aspects of dependency due to unemployment (q.v.) but supplied an unusually abundant support for various relief, investigational, and corrective agencies. In this connection the reader should consult the articles: JUVENILE COURTS; MINIMUM WAGE; OCCUPATIONAL DISEASES; OLD-AGE PENSIONS; PENSIONS FOR MOTHERS; PENALOGY; PROSTITUTION; WOMEN IN INDUSTRY; and WORKMEN'S COMPENSATION. In the numerous conferences of the year there was a marked tendency toward the perfection of organization for charitable agencies, elaboration and systematization of records, increased scientific inquiry with a view to prevention, and greater interest in general social, economic, and biological conditions from which poverty, destitution, and delinquency spring. The tendency toward better coördination is shown by the development of such bodies as the National Federation of Catholic Societies, the National Association of Jewish Social Workers, and na-

tional organizations interested in the blind, the deaf and dumb, or the tubercular; or in probation work, district nursing, or other aspects of social work.

THE NATIONAL CONFERENCE OF CHARITIES AND CORRECTION held its 43d annual meeting at Indianapolis May 10th-17th. The entire programme was devoted to subjects dealing with the relations of education and social workers to the fields of charity and correction. The efficiency of the Gary school plan and its social bearing, the effective development of the school centre, vocational guidance, and the promotion of effective public schools aided by various social agencies received special attention in the session on children under the leadership of Julia C. Lathrop of the Federal Children's Bureau. Under the sections on health, feeble-mindedness, and insanity, the significance of mental and physical factors for bad social conditions were discussed. The growing tendency to put relief work in the hands of public agencies received attention in the section on public and private charities; and emphasis was laid on the importance of the organization and administration of charity work and the keeping of proper records in accordance with the highest standards.

Several special meetings were held at which such subjects as birth control, results of vice investigations and surveys, welfare work in industrial establishments, and land and economic freedom were discussed. One such meeting was devoted to the discussion of relations between Socialism and social work and resulted in the creation of a committee to arrange for sessions on social workers and radical economic movements to be held during the next National Conference.

Among the most prominent speakers were: John H. Finley, Commissioner of Education of New York; Mrs. Florence Kelley, General Secretary of the National Consumers' League; Edward W. Clopper of the National Child Labor Committee; and Thomas Mott Osborne, former warden of Sing Sing. Percy Alden of London delivered an impressive speech on "National Stress as a Stimulus to Social Thought and Action," citing the influence of the present war on social welfare legislation in England.

For several years plans for a reorganization of the Conference have been under discussion. Each year many independent groups whose work is closely affiliated with that of the Conference meet jointly with it. A special committee previously appointed to consider relations with these kindred organizations proposed in its report to modify the Conference scheme of organization in such a way as to absorb these independent groups. The report suggested more continuous and permanent organizations of the main sections in the Conference, and pointed out the great desirability of a larger organization of the Conference office for work between sessions. The latter development would result in much more definite relations between the National Conference and State and local conferences. A special committee was appointed to further these proposals.

The desire for a new and more suitable name for the Conference which would stress the social service phase of its work rather than the charity phase is another expression indicating the transition in its work and character. To

deal with community ills and needs by prevention rather than primarily with the curing of individual ailments is the new policy. The committee appointed last year to consider a change of name reported in favor of such a move but recommended continuance of the committee in order to secure definite suggestions.

The proposed programme for next year would direct attention to the prevention of poverty, disease, defectiveness, and crime. The next session will meet at Pittsburgh with Frederic Almy of Buffalo as president. The vice-presidents are Joseph Lee of Boston, Julia C. Lathrop of Washington, and Rabbi Emil W. Leipziger of New Orleans. The committee chairmen for 1917 are: Executive, Rev. Francis H. Gaviak of Indianapolis; children, Wilford S. Reynolds, superintendent, Illinois Children's Home and Aid Society; correction, Roscoe Pound, dean, Harvard Law School; family and community, W. Frank Persons, New York Charity Organization Society; health, Dr. Charles P. Emerson, dean, University of Indiana Medical School; public charities, A. L. Bowen, executive secretary, Illinois State Charities Commission; mental hygiene, Dr. Owen Copp, Philadelphia; community programmes, Robert A. Woods, South End House, Boston; social insurance, Max Senior, Cincinnati; rural social problems, John H. Gillette, professor of sociology, University of North Dakota.

STATE AND LOCAL DEVELOPMENTS. State and local conferences are held annually throughout the country; only a few of these may here be referred to. Vermont held its first State conference in January. Indiana merged its State conference with the National Conference above noted. The New York State Conference on Charities and Corrections held its 17th annual meeting in Poughkeepsie during November. Dr. Edward L. Keyes read an important paper on "The Social and Public Health Aspects of the Venereal Disease Problem," and John A. Fitch one on "The Relation Between Trade Unions and Social Workers." Thomas Mott Osborne spoke on the Mutual Welfare League; this proved a lively meeting since Mr. Osborne's speech drew forth a rejoinder from State Superintendent of Prisons Carter. The next conference will be held at Binghamton, with Dr. Lee K. Frankel of New York City as president.

NEW YORK CITY AND STATE CHARITY CONTROVERSY. One of the most interesting controversies of its kind and one which will mark the beginning of more efficiently managed systems of public charity instead of the old incompetent system of heterogeneous private charity was that between the New York State Board of Charity and the New York City Charity Department. This controversy was long and bitter; it resulted from an investigation begun by the State Board in 1914. The investigation revealed shocking conditions in private or denominational homes in which were many public charges of the city. The homes were under both Protestant and Catholic administration and were paid by the city for the care of children. Notwithstanding the unsanitary and generally degrading state of affairs, these homes were given the necessary certificates by the State Board of Charities. R. W. Hibbard, the late Dr. Dan C. Potter, Father William B. Farrell, and Manager John J. Dunn were the

men who bore the brunt of the accusations, but the Supreme Court dismissed the charges against them in the September court.

The State board's defense was briefly: That under the constitution and laws of the State it is merely an inspecting and supervising body; that it has performed its full duty when it issues or withholds certificates on the basis of its inspectors' reports; that to withhold certificates for slight causes or for a protracted period would automatically stop payment of city money and tend to put an institution out of business; that it had been compelled to recognize that many institutions had not sufficient money to raise standards rapidly; that the city department itself has a duty at least to cooperate with the State board.

The city authorities replied by saying that the power to inspect and supervise carried with it the power to compel adherence to standards and that moreover the spirit of the age and laws of the State do not excuse the remissness of the board. The city administration has since been trying to meet the exigencies of the situation by the experiment of placing dependent children in private families through a bureau of the Department of Public Charities. Also through large appropriations for widows' pensions, the city is keeping in their own homes some children who otherwise would have to be cared for in institutions.

REPORT ON NEW YORK STATE CHARITIES. In October, 1916, Charles H. Strong, special commissioner appointed by Governor Whitman of New York to examine into the management and affairs of the New York State Board of Charities, of several related boards and commissions, and into the charges brought by the city Department of Public Charities against the State board on account of inspections of private institutions receiving money from the city, made a report of his investigations.

Upholding the charges of the city, the report recommended a thorough reorganization of the State Board of Charities and the abolition of several boards and commissions. In reorganizing the State board it would be made to comprise nine members appointed from the State at large, of whom three would be paid and six not paid; the new board would take the place of twelve unpaid members appointed by the Governor from districts; of the nine, at least one member would be a woman. Individual members would serve during good behavior and be removable by the Governor for cause. Special qualifications for membership are also recommended. Two new bureaus are recommended: a bureau for dependent children and one for mental deficiency. The report further recommended an express grant of power to the State board to adopt rules and regulations for the reception and retention of inmates in State charitable institutions. Also it urged the erection of an institution for defective delinquents, and the care of adult female delinquents in public institutions exclusively. It favored the abolition of the office of fiscal supervision of State charities, of the Salary Classification Commission, the Building Improvement Commission, the Commission on Sites, Grounds, and Buildings, and the Board of Examiners of Feeble-minded, Criminals, and other Defectives. Mr. Strong's plan was highly commended by some, while others saw only danger in some of the changes ad-

vocated. The New York State Conference of Charities and Correction officially placed that organization in opposition to Commissioner Strong's plan by resolutions adopted during its annual meeting in November. See also NEW YORK, *Politics and Government*.

NEW YORK CITY CHARITIES. There has been a reform in the method of handling applicants at the Municipal Lodging House, an institution for men and women out of work and funds. A medical examination of each applicant is given at entrance in order to segregate the infected and there is a miniature hospital to care for those who are ill. A mental test of each applicant is made and his social history as far as possible is recorded. Since the object of the workers in the house is not only to care for the unemployed but to aid them to become self-supporting, employment is furnished within the house if it cannot be found outside. In order to develop occupational work among convalescent and chronic patients of the hospital department and among inmates of city homes, a committee of prominent citizens was appointed by Commissioner of Charities Kingsbury to take charge of this work. The instruction is under the direction of a competent specialist. A Children's Home Bureau was a newly organized branch of the charities department. Its purpose is to provide for the placing of orphans and other dependent children under eight years of age in families of their own religious faith instead of in private child-caring institutions. This move has been made possible through private funds. Second Deputy Commissioner W. J. Doherty, for 15 years Executive Secretary of the Catholic Home Bureau, will supervise the new bureau. The department has also, with the aid of the Mendicancy Squad, regulated independent day nurseries.

MARYLAND. The Maryland Conference of Charities and Corrections held its 12th annual meeting in Baltimore on December 1st. Housing, vocational training, prison colonies, and infantile paralysis were the leading topics of the programme. A significant change was made both in the name of the conference and in the extent of its territory. Henceforth it is to be the Conference on Social Work, and its territory will embrace Delaware, Maryland, and the District of Columbia. The next meeting will be held in Wilmington, Del., with George S. Wilson of the Children's Board of Guardians of the District of Columbia as president.

By the 1916 Legislature, the Board of State Aid and Charities was reorganized with the Governor a member and the other members so classified that half of them retire every two years. The most important provision of the new law was the substitution of per capita appropriations to institutions in place of present lump sums with rates to be fixed by the State Board of Public Affairs. Another important measure affecting charity and social workers in many ways was that compelling adult children, who are financially able, to support their dependent parents instead of shifting responsibility upon the community. The law also provided that adults whether parents, guardians, employers, or others who contribute to the delinquency of children may be haled into court by an interested or responsible party. Circuit court judges are empowered to designate one of their number to sit in juvenile cases, thus making

possible the extension of the juvenile court system to all the counties.

**NEW JERSEY.** The New Jersey Legislature considered several features of the work of charity and correction during its last session. The committee appointed to study mental defectives was continued. A campaign by private interests to relieve overcrowded conditions in the State hospital for insane and to provide for the care of feeble-minded resulted in an appropriation of \$150,000 for a farm colony for insane. In the general appropriation bill \$25,000 was given for a feeble-minded colony under the direction of a board of managers of which the Committee of Charities and Correction is head. The campaign for a state psychopathic hospital was begun. The care of dependent children by the State was endorsed by an appropriation for the work of the State Board of Children's Guardians and for the work of supervising dependent widows and children who receive funds under the law to promote the home life of dependent children.

**THE IOWA STATE CONFERENCE OF CHARITIES AND CORRECTIONS** was held at Ottumwa, October 22nd-24th. Child welfare was the central subject of discussion, special attention being given to questions pertaining to larger use of the juvenile court, child-health in the pre-school period, stricter child labor laws, vocational training, and increased opportunity for recreation. A legislative committee of seven was appointed to cooperate with similar committees of other State organizations in order to bring about if possible social legislation regarding limitation of hours of work for women, establishment of child welfare research stations at State universities, and the codification of all laws relating to children. The president for 1917 is Paul S. Pierce of Iowa City.

**MASSACHUSETTS.** The Massachusetts Legislature passed several measures bearing on social work and charities. The old State Board of Insanity, which was paid, was abolished, and a Commission on Mental Diseases, which enlists unpaid service, was created. A new Bureau of Prisons puts responsibility on a director with an advisory body of five members, consisting of three men and two women. County hospitals for use of all communities of less than 50,000 inhabitants are to be established to complete a system of public tuberculosis sanatoria; and the State Department of Health was directed to investigate non-pulmonary tuberculosis. The new third school for the feeble-minded received an appropriation. A committee was appointed to study the housing problem, and another to consider the problem of habit-forming drugs. A bill dealing with workmen's wages provided that three-fourths of a workman's income are exempt from assignment and all assignments require the wife's consent.

**TEXAS.** In October the Texas School of Civics and Philanthropy opened at Houston. This is a new training school for volunteer and professional workers in the social and civic field, and was founded by the Houston Council of Social Agencies which is under the supervision of the Houston Foundation, a municipal board of public welfare. The foundation furnishes the school's support for the first year with the aid of interested citizens, hence no tuition or registration fees will be charged the beginning classes. Headquarters of the school are in the

Houston City Hall. Representatives of the University of Texas, Rice Institute, several other educational institutions, and officials of the State Conference of Social Welfare, the Federated Jewish Charities, and the Congress of Mothers and Parent-Teacher Associations make up its advisory council. A two years' course in class room and field work leads to a certificate, the entrance requirements being the equivalent of a good secondary school and two years of university work.

In November the Department of Public Welfare of the city of Dallas opened a three months' course in applied philanthropy under the auspices of the United Charities of Dallas. Lectures will be given by city officials, teachers, physicians, clergymen, and instructors in the Southern Methodist University.

**Bibliography.** Among publications relating to charities were the following: E. T. Devine, *Pauperism; An Analysis* (a pamphlet); Indiana Board of State Charities, *A Century of Progress*; C. S. Loch, *Charity and Social Life*; F. H. McLean, *Survey of the Charities of the City of Burlington, Vt.* Reports were issued by the National, the Canadian, and the New York State Conferences, among others of like source.

**CHARLES I, EMPEROR OF AUSTRIA AND KING OF HUNGARY,** succeeded Emperor Francis Joseph (q.v.) upon the latter's death Nov. 21, 1916. Although not in direct line of succession, being only a grandnephew of the Emperor, Archduke Charles Francis Joseph (as he was earlier known), came to be regarded as heir presumptive. The Archduke Francis Ferdinand (his uncle), who was murdered with his wife at Sarajevo, Bosnia, in July, 1914, had married outside of royalty, thereby greatly displeasing Francis Joseph, and although the Archduke at the time of his death was the heir, none of his children were to be allowed to succeed him. It had been decided that Charles should become co-regent in December, 1916. In marked contrast to the unenviable reputation of the murdered Archduke is that of the Emperor, about whom all of the little that is known is favorable. He was born at Persenbeug Aug. 17, 1887, the son of Archduke Otto and Princess Maria, who came from Saxony. It is said that his parents endeavored to keep him away from harmful court influences and therefore sent him first to one of the large Viennese boys' schools. Afterwards he went into the army and became a major in the 39th Austrian Infantry, also holding honorary commissions in Prussian, Saxon, and Bavarian regiments. His military life had been spent not in the capital but in distant garrison towns of the Empire until the European war, in which nominally he commanded the army that invaded Rumania. Charles is said to be a good linguist, as is necessary in a realm comprising 17 distinct nationalities, and he is popular with the people. Since the beginning of the war he has been receiving a training in foreign affairs from Count von Berchtold. The new Emperor was married in 1911 to the Princess Zita of Bourbon-Parma, in whom Francis Joseph found a strong resemblance to his murdered wife, the Empress Elizabeth. The royal couple have two sons and a daughter, the heir being the Archduke Francis Joseph Otto, born in 1912. The Emperor and Empress were crowned King and Queen of Hungary on December 30th, at Budapest. See AUSTRIA-HUNGARY, *History*.



**CHARMES, FRANCIS.** A French man of letters and publicist, died in Paris, Jan. 4, 1916. Born at Aurillac in 1848, and educated at the college of his native town, at the Clermont-Ferrand and Poitiers lyceums, and at the Ecole de Droit, Paris, he became editor of the *Journal des Débats* at 24. This post he held for eight years, and again from 1889 to 1907. From 1893 to 1907 also, he served as editor of the famous *Revue des Deux Mondes*, afterward being its manager. M. Charmes's political activity brought him several offices in the department of foreign affairs, and election as deputy, and later as senator, for Cantal. His literary distinction was recognized in 1908 by election to the French Academy. Numerous articles from his pen appeared in the journals edited by him, and for this type of writing he became best known. In book form he published *Etudes historiques et diplomatiques* (1893), and *L'Allemagne contre l'Europe: La Guerre, 1914-15* (1915).

**CHARRINGTON, JANET ACHURCH.** See **ACHURCH, JANET.**

**CHASE, WILLIAM MERRITT.** An American painter, known for his portraits and figure and still life studies, died in New York City, Oct. 25, 1916. He was born at Franklin, Ind., Nov. 1, 1849, studied art in Indianapolis and at the National Academy of Design in New York, and then went abroad, his masters being Piloty and Wagner in Munich. In that city, where he was associated with Frank Duvneck, he remained for some time, acquiring a reputation by his portraits. Throughout his life, he lived much abroad, especially in his Florentine villa, but he had studios in this country in New York, Philadelphia, and Shinnecock Hills, L. I. Mr. Chase's work gained wide recognition, in Europe as well as in the United States. His "Dorothy and Sister" was the first American painting hung in the Luxembourg, and at the Paris Exposition of 1889 he received a medal. His "Portrait of a Lady in Black" hangs in the Metropolitan Museum, and examples of his still-life paintings (his fish being especially noted) are in the Metropolitan Museum, the Pennsylvania Academy of Fine Arts, and the Brooklyn Institute Museum. The Union League Club, of New York, possesses his "Ready for the Ride." At the Panama-Pacific Exposition an entire room was devoted to works from his brush. Since 1890 Mr. Chase had been a member of the National Academy of Design, which awarded him the Proctor prize in 1912 for his "Portrait of Mrs. H." He was also a president of the Society of American Artists, before its amalgamation with the Academy, and had been admitted to the American Academy of Arts and Letters. His brilliant technique made him popular as a painter of portraits. Many distinguished men, including President Wilson, sat to him. Mr. Chase also became very well known as a teacher of painting.

**CHAUTAUQUA INSTITUTION.** It was noted in the 1915 YEAR BOOK that the attendance record of the Institution was adversely affected by the European war. During 1916, however, all previous records were surpassed. Between 50,000 and 60,000 persons, it is estimated, attended for longer or shorter periods. The Home Reading Course maintained its interest and numerical strength. In the Summer School (eight weeks' session) there were 3500

students in 200 different classes, the faculty numbering about 90. Income and attendance in this department showed marked growth. The official organ of the Home Reading Circle is *The Independent*, in which periodical *The Chautauquan* was merged some time ago. The members of the Institution receive monthly a bulletin of helps and hints called *The Round Table*. A New York office is maintained at 119 West 40th Street.

**CHEESE.** See **DAIRYING.**

**CHEMICAL INDUSTRIES, NATIONAL EXPOSITION OF.** See **CHEMISTRY, INDUSTRIAL.**

**CHEMICAL INDUSTRY.** See **CHEMISTRY, INDUSTRIAL.**

**CHEMICAL INDUSTRY, SOCIETY OF.** See **CHEMISTRY, INDUSTRIAL.**

**CHEMICAL SOCIETIES.** See **CHEMISTRY, INDUSTRIAL.**

**CHEMISTRY, GENERAL.** While no epoch-making generalizations or discoveries in chemical theory have been announced during 1916, the amount of research work carried on has been considerable. The continuation of the war in Europe has, of course, reduced to a minimum scientific investigations along lines not immediately concerned with the war and its problems; moreover, so few publications have been permitted to come through the Allied blockade during the year that practically nothing can be given concerning German chemical work.

Redeterminations of the atomic weights of six elements are known to have been published during the year, as follows: Bismuth, cadmium, columbium, hydrogen, neodymium, and zinc. In one case, that of columbium, the new values are considered an improvement over older ones, and the International Committee on Atomic Weights recommends that the value of this element be changed in the table to 93.1.

Prof. T. W. Richards of Harvard University and his associates have continued their researches on the atomic weights and physical properties of lead from different sources, and have confirmed and extended their previous results. The density of lead from Norwegian cleveite has been found by Richards and Wadsworth to be 11.273, which is distinctly less than any heretofore studied. The same authors have found the atomic weights of five different samples of lead to be as follows:

Ordinary lead .....	207.18
Radio-lead, Colorado .....	207.06
Radio-lead, Australia .....	206.34
Radio-lead, from bröggerite .....	206.12
Radio-lead, from cleveite .....	206.08

The last was the most carefully selected sample, and it is believed that the fact that this shows the lowest atomic weight is strong evidence that the higher results obtained from other samples were due merely to the accidental admixture of ordinary lead. As before, no new lines were found either in the ultraviolet or visible spectrum of any of these samples. Hence the atom of lead may be supposed to have a dual structure.

A branch of physical chemistry which has received considerable attention is the structure of crystals, particularly as brought out by x-rays. Previous successful interpretations of structure by this means have been made in almost every case on isometric or trigonal crystals, but Vegard, working at the University of Christiania,

has obtained important results with tetragonal crystals of oxides of the elements zirconium, titanium, and tin, and the related mineral zircon (zirconium silicate). The tetragonal structure has been found to be due, not to symmetry properties of the space-lattices of the metallic atoms, but to a tetragonal arrangement of the oxygen atoms. Each atom of metal lies between two oxygen atoms, the three being extended in a straight line, and the group thus formed, with the general formula  $MO_2$  (M standing for any one of the above listed elements), may be regarded as representing a sort of molecule within the main structure. The lines of these "molecules" are equally spaced and lie perpendicular to the tetragonal axis of the crystal, accounting for the fact that the vertical axis in these minerals is less than two-thirds as long as the horizontal ones.

In two elaborate papers on the constitution and fundamental properties of solids and liquids, Irving Langmuir of the Research Laboratory of the General Electric Co. has emphasized the chemical significance of the demonstration, through the aid of x-rays, that the crystals of polar substances are built up of separate atoms rather than of molecules. The atoms in such crystals must be held together by secondary or residual valence, and the whole crystal be regarded as a single molecule. In crystals of non-polar compounds group-molecules may be present, in which the atoms are held together by primary valence, but the group-molecules are in turn united by secondary valence. There is no longer any justification for dividing interatomic or intermolecular forces into "physical" and "chemical"; it is much more profitable to consider all such forces as strictly chemical in character. Evaporation, condensation, solution, crystallization, adsorption, surface tension, etc., should all be regarded as typical chemical phenomena. Experimental results are given which illustrate the applicability of this theory. In liquids as well as in solids features due to group molecules and to free atoms can also be recognized, and it now appears that molecules in the usual sense exist only in gases. The differences between a solid and a liquid, and in particular the mobility of the latter, are explained as a result of tautomeric rearrangements of the atoms. Adsorbed gases are to be regarded as chemically combined with the atoms forming the surface of the solid, the adsorbed layer usually consisting of a single layer of atoms or group-molecules. Correspondingly, the structure of the surface layer of atoms is regarded as the principal factor in determining the surface tension (energy) of liquids. This theory is also supported by abundant data.

In the Geophysical Laboratory of the Carnegie Institution of Washington at Washington, D. C., researches have been carried on in many different fields, and several publications have been issued during the year. The properties of the common refractory oxides—those of silicon, aluminum, magnesium, calcium, and iron—and of the products obtained by melting two or three of them together, as observed in the laboratory, have been summarized by Dr. R. B. Sosman. These oxides tend to unite in simple numerical proportions, regardless of what might be expected from primary valence relations of the elements concerned. The resulting products thus appear to be essentially "molecular" com-

pounds, this term being used, however, in a different sense from that which it bore in the early days of chemistry. The conception of fixed valence has been of great value in organic chemistry, but is of little application in the inorganic field.

The several forms of calcium carbonate have been studied by Johnston, Merwin, and Williamson of the same laboratory. Three crystalline anhydrous forms are recognized: calcite, aragonite, and a form designated  $\mu$ - $CaCO_3$ . There is also a hexahydrate,  $CaCO_3 \cdot 6H_2O$ . Calcite is the stable form under ordinary conditions, and all the others tend to revert to it. Indeed the factors which determine the precipitation of aragonite cannot as yet be specified, although it is known to be formed through organic agencies, by deposition from hot springs, in the presence of nuclei of carbonates isomorphous with it, and in salt waters containing sulphates at ordinary temperatures. Optical, crystallographic and chemical tests have been worked out for differentiating these forms.

Still another research of chemical importance carried on in the Geophysical Laboratory concerns the reactions involved in copper sulphide enrichment, and has been reported on by Zies, Allen, and Merwin. The various minerals containing copper, iron, and sulphur have been prepared synthetically and have been subjected to the action of copper sulphate solutions, and the reactions which take place have been carefully worked out. The stable end product is in most cases chalcocite,  $Cu_2S$ .

**QUALITATIVE ANALYSIS.** In the presence of phosphates the usual schemes for the qualitative analysis of the iron and alkaline earth groups are unsatisfactory, and Robert Gilmour of the University of Edinburgh has worked out a scheme in which the alkaline earths are first precipitated by sulphuric acid and alcohol; the metals of the iron group can then be detected in the filtrate. By the use of sodium peroxide a further separation of aluminium, chromium, and zinc, which yield soluble compounds, from iron, nickel, manganese, cobalt, and magnesium which become insoluble, is effected. The iron (and phosphorus) can be separated from the other elements by the usual basic acetate method. Trials of this scheme with unknowns showed it to be satisfactory, and it certainly possesses several advantages over the one hitherto used.

Methods for the accurate, systematic qualitative analysis of cations (metals) have been worked out in considerable detail, but heretofore there has been no thorough study of anions in this manner. Weber and Winkelmann have been investigating this subject at the University of Illinois, and published during the year a scheme for the separation of the anions of group I, those yielding insoluble silver salts but soluble barium salts, comprising the halogens and the simple and complex cyanides.

**QUANTITATIVE ANALYSIS.** Perhaps the most striking feature of the development of quantitative analysis during the year has been the further extension of the use of the hydrogen electrode. In this method a spongy platinum or palladium electrode bathed in pure hydrogen gas is immersed in the liquid to be examined, the other electrode being a sample wire, and the electromotive force or potential developed is measured by appropriate electrical instruments. This method has been applied to the study of the

reaction of soil extracts by Gillespie in the U. S. Bureau of Soils and by Sharp and Hoagland at the California Experiment Station. Its most useful application is, however, to the determination of the end point in titration, where changes in the colors of indicators are inaccurate or inapplicable. Kelley and Conant of the Research Department of the Midvale Steel Co. have worked out a method of titration of vanadium with ferrous sulphate, the end point being obtained by observing changes in potential, which is very convenient in the analysis of vanadium-iron alloys. The same authors later extended the method to chromium. In order to ascertain the most favorable conditions for the precipitation of aluminium as hydroxide William Blum of the U. S. Bureau of Standards has used the same apparatus, and has found that precipitation is complete between the concentrations of hydrogen ions  $10^{-9.5}$  and  $10^{-7.5}$ , points approximately defined by the color changes of methyl red and rosolic acid. Considerable activity has also been shown in the study of indicators with reference to the hydrogen ion potential at which they show color changes, and the application of such indicators to the determination of the acidity or alkalinity of liquids, especially bacteriological culture media and various biological fluids. Lubs and Clark of the U. S. Department of Agriculture have prepared a number of sulphonephthaleins which are of great practical value in such studies.

During the year 1916 occurred the death of two eminent chemists, as follows: Harry C. Jones (q.v.), Professor at Johns Hopkins University, one of the foremost of American physical chemists, whose work on the condition of dissolved substances and related fields was of the most fundamental importance; and Sir William Ramsay (q.v.), known as the discoverer of five new elements in the atmosphere, and who proved conclusively, in collaboration with Soddy, that radium on disintegration yields helium,—the first definite instance of transmutation.

**CHEMISTRY, INDUSTRIAL.** (See also CHEMISTRY, GENERAL.) The year in industrial chemistry has been one of positive progress. Hope has yielded place to reality and results have sustained theory, not only so far as dyestuffs are concerned but all along the line. The manufacturers in the United States have greatly increased their production of coal tar dyestuffs and it is now almost sufficient to supply the home demands. The developments seem to indicate that with sufficient capital and adequate protection the United States could lead the world in its chemical manufactures. Two interesting evidences of this fact are shown in the commercial production of camphor and indigo made by synthesis in this country. The tendency of the governments of the United States and Great Britain to avail themselves of the advice of scientific experts, especially in chemistry, is also noteworthy.

**ORGANIZATIONS.** The American Chemical Society held its spring meeting at the University of Illinois in Urbana-Champaign, Illinois, during April 17th-21st, at which the new building devoted to chemistry was dedicated and appropriate addresses made. The annual meeting was held at Columbia University, New York, during September 25th-30th, contemporaneously with the second National Exposition of Chemical Industries. The total membership now exceeds

8300. The president for 1916 was Charles H. Herty, and Julius Stieglitz was elected president for 1917.

The American Electrochemical Society held its spring meeting in Washington, D. C., during April 27th-29th, and its autumnal meeting in New York City during September 27th-30th. The president during the year was Lawrence Addicks.

The Society of Chemical Industry held its 35th meeting in University Union in Edinburgh, Scotland, during July 19-21, 1916, under the presidency of Charles Carpenter. The membership was reported as 4050 as compared with 4017 last year. The retirement was announced of Charles G. Cresswell, who had served as secretary since 1884. Dr. Charles Carpenter was continued as president, and Birmingham, England, selected as the place of meeting in 1917. In lieu of presenting papers descriptive of progress made in industrial chemistry, the meetings were devoted to the consideration of papers of general interest, such as summaries of the advancement made in a given branch.

**NATIONAL EXPOSITION OF CHEMICAL INDUSTRIES.** During the week of September 25th-30th there was held in the New Grand Central Palace in New York City, the second National Exposition of Chemical Industries, at which exhibits and demonstrations of products, processes, machinery, and apparatus applied in the chemical industries were made by leading manufacturers from the United States. The capital represented by the exposition was said to amount to \$2,750,000,000. The exhibits were too numerous to describe, but as last year the most striking feature of the exposition was its revelation of the astonishing rapidity with which an American coal tar chemical industry is being created. Formerly most of the coal tar, benzol, and ammonia liberated by the by-product coke ovens was allowed to go to waste. Now it is all recovered. There has been a remarkable growth of industries producing dyestuffs, explosives, photographic chemicals, synthetic medicinals, flavors, and perfumes from coal tar. Most of the new companies engaged in building up the American coal tar chemical industries displayed their products in the exposition. President Herty of the American Chemical Society in one of his addresses called attention to the fact that American chemists "were achieving unexampled success and that gaps were being filled rapidly. The gains made were permanent and would remain regardless of when the war ended." This applies not only to domestic dyestuffs and potash but to a large number of intermediates and other products formerly obtained abroad. Besides the demonstrations afforded by moving pictures of technical subjects, advantage was taken by the meeting contemporaneously of the American Chemical Society and the American Electrochemical Society to present the following public addresses: "Chemistry and the National Welfare," by William Crozier, Chief of Ordnance, U. S. A.; "Chemistry and Banking," by John E. Gardin; "Chemistry and Conservation," by Gifford Pinchot; and "Expanding Relations of Chemistry in America," by Charles H. Herty. This exposition was visited by twice as many persons as the one last year, and at its close plans were inaugurated for a similar exposition to be held next year. Arrangements were made to add another floor to

the exposition space, making room for several hundred additional exhibits.

**RELATIONS OF CHEMISTRY TO GOVERNMENTS.** In the United States the Committee on Industrial Preparedness of the Naval Consulting Board of the United States, under the chairmanship of Howard E. Coffin, has organized the industries of the country for national service in the event of war. A preliminary report showed that not a manufacturer had failed to respond to the call. The number of manufacturing and other plants which were registered for possible war service was about 100,000. The mobilization of industries is in the hands of 30,000 engineers, organized in State divisions, who constitute the field force of the Naval Consulting Board in this part of its work. They serve without pay. The great war has taught the astonishing adaptability of national industries when properly inventoried and organized. It has been ascertained that a dye factory, for instance, may be transformed within ten days into a plant for the production of high explosives. The Committee on Industrial Preparedness, enlisting as it has the best scientific and commercial brains in the country, thoroughly understands this and is guiding its labors thereby.

In Great Britain chemists of military age are entitled to exemption as "analytical, consulting, or research chemists" and notices calling attention to this fact were sent out in February by the London Chemical Society.

**MEDALS.** On January 21st the W. H. Perkin medal was awarded to Dr. Leo H. Baekeland of New York for his most original and valuable work on applied chemistry, and especially for his production of the new material called bakelite, formed by the action of formaldehyde on phenols. The William H. Nichols medal for distinguished research work was awarded on March 12th to Dr. Claude S. Hudson of the U. S. Bureau of Chemistry. The Willard Gibbs medal of the Chicago Section of the American Chemical Society was on May 19th presented to Willis R. Whitney of the General Electric Company of Schenectady, N. Y., for his researches on the application of chemistry to electric lighting. In Great Britain the medal of the Society of Chemical Industry was given to Charles F. Cross on July 19th for his conspicuous services to industrial chemistry, notably for his researches on fibres, in which his work is classic.

**METALS.** *Cerium.* This rare metal, which is used for gas-sparking devices, is now reported available from American sources. *Magnesium.* Metallic magnesium, now on the market, is said to be made in the United States. *Manganese.* The production of this metal has increased threefold since the cessation of its export from Russia to the United States. Its price has largely increased owing to the demand for the dry battery and flint glass industries. *Nickel.* The output of nickel ore from the great districts at Sudbury, Canada, has been smelted by the International Nickel Co., at its plant in New Jersey, but since the war, and especially during the year, it was seriously agitated as to whether it would be best for the Canadian government to take over the deposits and require their refining at home. *Platinum.* The announcement of the discovery of deposits of platinum, chromium, and nickel in Spain has been corroborated by the Spanish government, under whose directions they will be worked. These deposits are said to be

very rich and it is hoped that the new source of supply will cheapen the price of this valuable metal. *Tin.* Tin ore from Bolivia is now imported into the United States and refined at works that have been erected at Perth Amboy, N. J. The output of this plant began in May with three tons a day and in August reached 10 tons, with promise of even greater quantities. It is claimed that the fineness of the tin runs about 0.994. The only impurity of any consequence is lead, and in a week's run this amounted to only 0.0025. The ore is the dioxide and after smelting is refined electrolytically. *Tungsten.* Until the war began the sources of tungsten were chiefly in Germany, where the ore was refined, but deposits were discovered in California in 1913 and are now being worked, and in July a mill of 300 tons daily capacity in Inyo County was turning out the metal. In Great Britain the supplies from British colonies have been taken over by the government and are now being worked in England so as to supply the demands for high-speed steel and for electric light bulbs. New deposits of tungsten and molybdenum are reported from Chile.

*Iron and Steel.* A new method of producing pure iron is announced by Trygve Yensen of the University of Illinois. It consists of melting electrolytically refined iron in a vacuum, thus reducing the impurities far below any point previously reached. The magnetic property of this vacuum-fused iron is as remarkable as its purity. Its maximum permeability, i. e., measures of ease with which it can be magnetized, was found to be several times higher than for the best magnetic iron or iron alloy previously produced. The annual saving to the electrical industries of the United States by application of this discovery will amount to nearly \$20,000,000, if it should be found that the iron can be produced at the same expense as the iron now used. A process for extracting ferro alloys of manganese and silica from slag, which it is claimed will result in large saving to steel manufacturers, has been discovered by George A. Hays of Sewickley, Pa., and George D. Lain of Elmira, N. Y. Ferromanganese and silica are essential elements in the manufacture of steel, but since the start of the European war both have greatly advanced in price. As a result of the new process, slag, which has always been practically a waste product, will now become of economical value. The substitute for manganese in the manufacture of steel, the discovery of which by German chemists was announced from Berlin in February, is proving entirely satisfactory and the output is being rapidly increased, according to a bulletin issued by the War Committee of German Industry. Dr. P. H. Dudley announces that after 40 years' research, he has found the cause for flaws in steel rails which has resulted in so many railway accidents, to be due in part to an occasional hot rail being cooled so rapidly by the rolls and their pressures to elongate the bar, or chilled by gusts of air before recalcence in the hot beds, as to cause a lag of some of the transformations of the metal in the interior of the head. These conditions can be avoided and will be in future, thus removing a distinct cause of railway accidents. See METALLURGY.

*Potassium.* The shortage in the amount of potassium salts required for domestic consumption was referred to in the YEAR BOOK for 1915 (page 132) and the efforts made to meet the de-

mands were mentioned. Since then the situation has not improved materially. The United States Geological Survey reports that "every clew that might yield valuable results has been followed up in a country-wide investigation extending from New York to California." Great activity has been manifested in experiments for the recovery of potash from the silicate rocks, such as feldspar and leucite, from mica sericite, and from green sand. In many laboratories researches have been in progress, some of which offer prospects of profitable commercial development if feldspars and other potash-rich rocks in sufficient quantity and purity can be found and made available. Manufacturers of Portland cement, in view of a possible revenue from by-product potash, have not been slow in investigating their raw material. A company near Hagerstown, Md., is reported to be installing a plant for the recovery of potash salts. (See also under CEMENT.) It was also reported that potash was recovered as a by-product from the manufacture of Portland cement in Riverside, Cal. By-product potash from this source has yielded a considerable revenue, owing to the high price for potassium salts, and in obtaining it two other purposes have been subserved,—the saving of additional material to be converted into cement, and the elimination of the dust nuisance. Reports of activity in the recovery of potassium salts from the brines and muds from western Utah have been received, as well as similar reports from deep holes sunk in the deserts of Nevada and in the Panhandle of Texas. Also further progress in the increased use of kelp as a source of potassium salts has been received from the western coast. In Leeds, England, an investigation of banana stalks as a source of potassium salts revealed the fact that over 4000 stalks came into Leeds every week which when dried yielded 1340 pounds of matter as rich in potash as kainit, i. e., 188 pounds of dried matter contained 13.7 per cent of potash, or 54 pounds of ash containing 47.5 per cent of potash. Reports of the discovery of extensive deposits of alunite in British Columbia are of importance. Analyses of samples showed the presence of nearly 5 per cent of potassium oxide. The raw material has been used to advantage as a fertilizer and the roasted mineral gave double the yield in increasing the crops when experimental comparisons were conducted on similar tracts of ground. Of passing interest was the announcement in September of the discovery in Cuba of large deposits of minerals containing soluble potassium salts. Samples that were analyzed showed as high as 12½ per cent of soluble potassium salts. Later investigations made by an engineer of the Cuban government showed that the deposits did not contain sufficient potassium salts to make the working of the claims commercially profitable.

*Sodium.* A new market for the manufacture of sodium carbonate and sodium silicate has been patented in England. The process is described to be essentially as follows: Previous attempts to produce sodium carbonate containing five molecules of water have yielded a salt which would cake into bricklike hardness, even when ground into fine powder. In this process a mixture of 106 parts of 58 per cent alkali and 90 parts of water is introduced into a Pfeleiderer machine, which is kept in motion at a determined speed. As a result an absolutely stable carbonate, containing five molecules of water, is obtained in

the form of a powder which shows no tendency to cake. It does not absorb moisture from the atmosphere, nor does it effloresce. For the manufacture of bleaching sodas containing sodium silicate, this powder is mixed with the required quantity of powdered silicate, made by the process described further on. The mixture never cakes, is always ready, and is easy to use. It serves admirably in the manufacture of scouring powders and soap powders. For all purposes requiring the use of soda the new product gives excellent results. It is not so caustic as ordinary 58 per cent alkali. It dissolves more readily than other forms of soda, and is easily handled. The process of making the sodium silicate is as follows: Silicate glass is introduced into a pulverizing machine with a certain amount of water. This amount depends upon the strength of the sodium silicate desired. The revolution of the machine brings about a gradual pulverization and hydration of the silicate. After the operation has continued for a time the contents, which resemble milk in appearance, undergo special treatment causing solidification. This solid form of sodium silicate can be easily ground into powder. It can also be prepared in a liquid or gelatinous condition. It is neutral and the solution can be concentrated to any required point. The solid silicate can be packed in crates or boxes. Among the uses of sodium silicate, in which such an improved form of preparation offers distinct economy, are the manufacture of concrete and artificial stone; of fire clay; of grindstones and emery wheels; of acid-resisting cements for jointing, insulating purposes, and waterproofing walls; of fireproofing; of steam-pipe covering; of asbestos slates, uralite, etc.; in the textile trade as a sizing, bleaching, or fixing agent; as a very valuable detergent and scourer; for rendering fabrics incombustible; as a sizing material for paper; for water paints and enamels; for drain-pipe cements; as a detergent and filling agent in soaps; for preserving eggs.

*NITROGEN.* At the very end of 1915 the Southern Electrochemical Company announced the commercial production of nitric acid from the air at its works at Great Falls, S. C. The principal use of this nitric acid at present would naturally be in the manufacture of nitrates, used so largely in the manufacture of explosives and of artificial fertilizers. Early in the year the president of the Du Pont Powder Co. made a proposal to the War Department to negotiate a contract under which the company would begin the construction of a plant under such units and magnitude as should be agreed upon, the Du Pont Company to furnish the capital. It was estimated that the cost of such a plant would involve an investment of \$20,000,000. The Du Pont Company also announced that it owned the arc process, as used in Norway, for the manufacture of nitric acid from the air. The Naval Consulting Board in March adopted a resolution calling attention to the fact that the synthetic production of nitrogen products, which was so successfully carried on abroad but not in the United States, was immediately vital to the agricultural and military interests of this country, and that therefore efforts should be made for the synthetic production of nitrogen by the government. Accordingly an appropriation of \$20,000,000 was made by Congress for the erection of a plant somewhere between the Allegheny Mountains and the Sierra Nevadas, in the interior of the country so as to be situated at

a safe distance from either sea coast. In May the announcement was made of the incorporation of the Air Reduction Company with a capital of \$2,500,000 for obtaining both liquid oxygen and liquid nitrogen from air by the process invented by Georges Claude, a French chemist. (See "The Sources of Nitrogen Compounds in the United States," by Chester G. Gilbert, *Smithsonian Miscellaneous Collections*, No. 2421, 1916.)

**BROMINE.** The entire photographic trade has suffered seriously from the lack of bromine for use in the manufacture of the bromides employed in the production of photographic chemicals. The scarcity of bromides for use in therapeutics has been felt also by the medical profession. The announcement is made that the bromine wells near Pomeroy, Ohio, and Mason City, W. Va., have been put into active commission, after remaining idle for years. The monthly production will be five or six tons. This amount will lessen the present shortage. It is probable that American manufacturers of bromides will be able soon to meet the normal demands of domestic consumption.

**FUEL.** In Sweden an investigation as to the use of peat-powder as a fuel for locomotives resulted in a report showing that it had a fuel value compared with that of coal of about two to three. The ratio of peat-powder will probably be greater when it has been used and experimented with further. Therefore it is desirable to use peat-powder, especially as the native resources will be utilized. An appropriation has been asked for the erection of a peat-powder factory at the Hästhagen bogs and for the use of enough locomotives for peat-powder so that all the trains on the Falköping-Nassjö line may use this fuel. Not only has improvement been made in Hawaii in the extraction of sugar from the cane, but savings have been effected in reducing the losses from other sources, as waste molasses and press cake. Formerly nearly 80 per cent of the exhausted molasses from the Hawaiian factories was thrown away as useless. Furnaces are now being installed which burn this molasses, the heat going to furnish steam for the factory; and the ash from the molasses, which contains 33.32 per cent potash and 4.60 per cent phosphoric acid, is used as fertilizer.

**FERTILIZERS.** The great demand not only in the United States but elsewhere for artificial fertilizers is so largely a matter of the different ingredients of such fertilizers, especially potassium salts that the subject has received treatment under *Potassium*. Nevertheless various materials have come into use as artificial fertilizers which may be mentioned. Seaweed which is rich in potassium salts, nitrogen, and phosphoric acid is used in Nova Scotia and efforts are being made by the government to find a method by which seaweeds may be dried and ground economically. In Manchester, England, the municipal authorities have undertaken the experimental manufacture of bacterized peat or "humogen," which was discovered by W. B. Bottomley. (See YEAR BOOK for 1915, page 133.) In Spain where common salt is obtained from sea water by evaporation the mother liquor containing potassium and magnesium salts is now recovered as follows: The mother liquors from the salt gardens are run into tanks and submitted to further evaporation. After a certain amount of the solids present have been deposited the residual liquor is evaporated to dryness by a special

process. The solid residue thus obtained closely resembles in composition the mineral kainit. It contains about 12 per cent of potash. An interesting application of chemistry to agriculture is shown by an investigation carried on by the Hawaiian Experiment Station which showed that soil containing manganese rendered insoluble the iron needed for the best growth of the pineapple. The injection of a hypodermic needleful of iron sulphate solution quickly improved the pineapple and now the best means of making the iron salts available are being studied. See FERTILIZERS.

**PAPER MAKING.** The continued and growing scarcity of paper stock, especially of quality for newspapers, has resulted in increasing search for a satisfactory material. In July came the announcement from Germany that after experimenting on various materials an excellent quality of paper had been made from cotton stalks. This probably led to the advocacy in the Southern States of the use of cotton waste and stalks as material for paper stock, but the experts from the Department of Agriculture pointed out that in 1908 it had been shown that while cotton stalks were sufficiently "woody" for the purpose, it was doubtful whether any attempt at making paper from this material would be commercially successful. Cotton stalks are more fibrous than corn stalks from which a fair grade of paper can be made. Later the Department of Agriculture issued a bulletin describing the use of hemp hurds (the waste stalk fragments produced in preparing hemp fibre for market) for making paper. The bulletin itself was printed on paper made from hemp wastes. The paper, which was the first ever made in the United States from hemp, was described as "of good body, clear white cream texture, and very satisfactory calendered finish." The Bureau of Science in the Philippine Islands has continued its studies on the suitability of bamboo, cogon grass, abaca, and various palm fibres for paper pulp. In India kaing grass has been found satisfactory for making paper. It is comparable to esparto grass, and it is cheaper. Paper pulp manufactured from wood in Japan is now being imported from that country to supply needs in the United States. The manufacture of coal from waste material of paper factories—an industry which promises to reduce the cost of both paper and coal—is described as follows: The lye is mixed with some foreign material after boiling the sulphite, and then transferred to a large kiln, where it is boiled again under high pressure. During this process the lye is changed and the substance which is converted into coal, sinks to the bottom and is taken out in the form of a thick black paste. The water which remains in the paste is then removed in a centrifugal machine and the residue is the coal in a powdered form. The powder can be made into briquets and used in the same manner as coal. Under the sulphite process in paper-making only 45 per cent of the weight of the timber is utilized. The remainder falls as refuse into the lye and it is this that is transformed into coal. The announcement is made of a new process for making paper by Wallace P. Coho, who has taken pattern from the silkworm, by providing that finely woven cotton cloth be treated and locked in by viscose; hermetically sealed in artificial silk. This is a permanent product and the result is a paper of varying thickness according to the weight of the cotton cloth used and the nature of its covering. The

paper is easy to write upon, agreeable to the touch, and should endure for several hundred years without change. A new textile from Germany in which paper is spun with about 20 per cent of cotton is described as follows: Unspun cotton in the form of down is glued to one side of endless rolls of paper, and the paper is then shorn into narrow bands which are spun with the cotton side outward. Paper underclothing, jerseys, sheets, bandages, and horse blankets have been made, but the cost of production is too great to allow of its competing with cotton or woolen cloth.

**SYNTHETIC CAMPHOR.** During the year ending June, 1916, there were imported into the United States 4,574,430 pounds of camphor, valued at \$1,236,172, and also 1,866,154 pounds of synthetic camphor, valued at \$619,320; all of which came from Japan where the price of slab camphor increased from \$23.15 a 100 pounds in 1915 to \$33.36 for the same quantity in 1916. Accordingly the American Camphor Corporation began the operation of a factory in Philadelphia, Pa., for the production of synthetic camphor. Whether this is but a temporary effort remains to be seen, but it is the beginning of a new chemical industry in the United States.

**PHOTOGRAPHY.** A method of printing silk fabrics by color photography, announced in October, consists in making three successive impressions—blue, yellow, and red—from three selected photographic prepared plates. The fabric is rendered sensitive by mixtures of alkaline phenols and diazo sulphites, products which possess the property of giving coloring matters only through the influence of light. The precision needed in superposing the three impressions is secured by carrying out the work on a special frame, the fabric having been previously provided with metallic eyelets to avoid tearing it. The development of the colors is accomplished with better regularity by exposure to electric light. The method is recommended as more especially applicable in the treating of articles that cannot well be printed by machine. From Rome, Italy, comes the simple statement of an important scientific discovery of a method of photography reproducing natural colors, found after eight years of experimenting.

**COTTON SUBSTITUTES.** The Germans have shown great ingenuity in the development of substitutes for articles available only by importation. The impossibility of obtaining sufficient cotton, so necessary in the manufacture of explosives, in surgery, etc., led to the use of various substitutes as was indicated in the *YEAR BOOK* for 1915 (page 136). During the year the experiments by Oswald Richter, of Vienna, have resulted in obtaining the fibre from nettles. Previous experimenters had followed the methods used with other plants but had failed to obtain satisfactory results. Richter found the reason. Nettles contain much fruit sugar, which is all steeped out during the first half day that the plants lie in water; and then a fermentation process sets in which is due to the development of bacteria that feed upon the sugar and then destroy the value of the fibre. After Richter established these facts, he had only to draw off the water after soaking the nettles for 12 hours, and then turn on fresh water. Then another class of bacteria, which do not attack the fiber, is developed, and retting proceeds as normally as with flax. The machinery for separating fibre and

stalk is the same as for hemp, and existing spinning and weaving machines are used in making nettle cloth, with a few minor changes. The cloth is now being made in Austria. About 1000 tons of the fibre were produced there last year under the auspices of the government, which turned it over to various factories to be worked up. It is asserted that the fibres are from 2 to 12 inches long. After having been washed in a soap solution they are very soft and produce a cloth having a fine lustre. The yarn is pronounced considerably stronger than flax yarn, hence nettle cloth should prove remarkably durable. While the supply of wild nettles in Germany and Austria is practically inexhaustible, it is probable that it will be necessary to cultivate the plant in order to get the best results.

**MOTOR FUEL.** The great demand for gasoline as a motor fuel as well as its increasing price is giving rise to various substitutes. Of those used in Great Britain the new Lightning Motor Fuel has been found acceptable. It consists of 50 per cent gasoline and 50 per cent of chemicals, the nature of which is secret. Its cost is about one-half that of gasoline. Another substitute is an intermediate between gasoline and oil and can be stored like oil. It also is cheaper than gasoline but the car must be started with petrol and then may be run with the substitute. A third variety of secret composition, one ingredient of which is wood spirit, is much used. The Germans have found an alcohol-benzol mixture consisting of one part benzol and one to five parts alcohol most satisfactory. Difficulty is had with the starting of the motor as is the case with the English substitute. The cost of this mixture is less than gasoline and it will survive the war. At the meeting of the American Chemical Society, held in New York City in September, this subject was discussed and alcohol from various sources, such as sawdust and molasses, was suggested with explanations of special methods required for its extraction. Natalite is a product made in Durban, Natal, and consists of 60 per cent alcohol from molasses and 40 per cent ether. In Sweden peat is used for producing liquid fuel, and a novel form of retort has been constructed that is capable of extracting five times as much gas from a ton of bog peat as is at present obtained from a ton of gas coal. The possibilities of this new invention are enormous; for the gas obtained from peat possesses almost as high calorific power as coal gas and it is found to be unusually rich in benzol and ammonia. See **AUTOMOBILES**.

**ARTIFICIAL RUBBER.** At the close of 1915 Chancellor Bethmann-Hollweg announced to the Reichstag that German inventors had discovered a method of producing synthetic rubber. Later came the information that the Department of Finance in Russia had found a chemist in Moscow who was able to make synthetic rubber with alcohol. It was claimed that rubber could be made by him from certain vegetable oils, such as hemp-seed oil and rape-seed oil with alcohol, and the necessary alcohol was readily available from the enormous quantity of vodka that had been stored by the government since the decree has been issued forbidding its use. In consequence, the Department, keenly alive to the possibilities of this discovery, which not only solves the problem of the disposal of vodka, but also relieves the famine in rubber, decided to begin the manufacture of the rubber by this process as

soon as arrangements could be made with the inventor. An experimental plant was at once constructed.

**NEW PROCESSES FOR COAL AND PETROLEUM PRODUCTS.** Referring back to the discussion under this head in the YEAR BOOK for 1915 (page 134) it may be well to add from reports made to the United States Geological Survey, by all of the by-product coke plants in the United States showing that the output of benzol and other light oils in 1915 amounted to 13,942,763 gallons, in connection with which there were produced 761,256 pounds of naphthaline, a solid crystalline substance. Thirty-one coke-making establishments with 4933 by-product ovens contributed to this total, and it is estimated that between 8,000,000 and 9,000,000 tons of coal were carbonized in the ovens that furnished the gas from which the oils were recovered. The annual capacity of the benzol-recovery plants now in operation is estimated at more than 20,000,000 gallons, and with the completion of plants now building, will probably exceed 22,000,000 gallons. In May the United States Senate adopted a resolution authorizing the Secretary of the Interior to receive assignments from Walter F. Rittman of his patent, which is expected greatly to increase the yield of gasoline. The process may be leased only to persons or firms who will agree that if they discover any improvements to it, they will give them to the United States instead of patenting them for themselves. Estimates given out in June by the Bureau of Mines, on the first returns from the new Rittman process plant at Coraopolis, Pa., indicate that the cost of producing gasoline by this method ranges from 7 to 13 cents a gallon, according to the price of crude material. Twenty different concerns have taken out licenses from the government for the installation of the Rittman process, which by "cracking" the heavier residuum oils of petroleum distills them into volatile ones. Two of the licenses are already producing oil by the process. Dr. Charles S. Palmer of the Mellon Institute of Pittsburgh, Pa., patented in June an improved process that consists of extracting gasoline from petroleum residues which have practically no volatile matter below a temperature of 300 degrees centigrade. When they are subjected to this temperature, under conditions prescribed by the process, about 75 per cent of their composition becomes volatile, and of this about 20 per cent is gasoline. The basis of the process is said to be the inter-related control of temperature, pressure, and time, these factors being so applied that recomposition of the elements in the petroleum residue results, one of the recomposed products being gasoline. See "Manufacture of Gasoline and Benzene-toluene from Petroleum and Other Hydrocarbons," by W. F. Rittman, C. B. Dutton, and E. W. Dean, with a bibliography compiled by M. S. Howard, (*Bulletin 114, Bureau of Mines*, 268 pp., Washington, 1916). Also see "The Role of Chemistry in the War," by Allerton S. Cushman in the *Journal of the Franklin Institute* for February, 1916.

**DYESTUFF SITUATION IN THE UNITED STATES.** Continuing the information discussed under this heading in 1915, it may be said that in February there was a conference on the dye situation held in Washington in the office of the Secretary of Commerce, at which it was agreed that "a serious shortage of dyestuffs exists, and that in spite of the fact that the domestic manufac-

turers of dyestuffs are now producing more dyestuff materials than ever before, and their output is growing, the production is scarcely as yet sufficient to meet more than one-half of the demand, and that the variety of colors now produced by the domestic manufacturers of dyestuffs is limited. A very large proportion of the domestic output consists of blacks and of the more easily manufactured colors." The conference also agreed to bring to the attention of the public in every way possible the need of cooperation between the consumers of dyestuffs and between the manufacturers of textiles and clothing on the one hand and the consumers of these goods on the other. The expert of the Bureau of Foreign and Domestic Commerce, Dr. Thomas H. Norton, continued his splendid campaign of conveying information to both manufacturers and consumers during the year. In September he reported that "two years ago a single firm made aniline on a small scale, while six companies produced artificial dyestuffs from intermediates imported from Europe. To-day 18 companies are manufacturing synthetic carbolic acid, and over 40 are producing aniline and other intermediates. Over 30 companies are making coal-tar dyes. The total number of operatives in this branch two years ago was 400; now single establishments employ 1000 workmen. In 1914 we made one-tenth of the synthetic colors consumed in the United States by 'assembling' foreign semi-manufactured colors formerly required by our textile, paper, and other industries, and now every pound is made from American coal tar." As corroborating this statement the following extract from the Bureau of the Census may be added: "The recovery of coal-tar 'crudes' from the by-products of coke plants has now been so perfected that the output is more than sufficient to cover the needs of a national color industry. Two years ago the annual output of these crudes was estimated as follows: Benzol, 9600 short tons; toluol, 3200 tons; naphthaline, 1500 tons; and phenol, 75 tons. To-day the estimated annual output is: Benzol, 90,000 tons; toluol, 22,440 tons; naphthaline, 12,500 tons; phenol (chiefly synthetic), 10,000 tons." Concerning dyestuffs the report shows that in 1909, 124 plants turned out \$16,788,676 worth of products, and in 1914, 133 plants produced \$21,741,122. During the year Dr. Norton devoted much attention to the preparation of a census of artificial dyestuffs which consisted essentially of a detailed statistical study of American dyestuff imports, proof-sheets of which giving in detail information as to the 5674 different brands of synthetic dyes that were imported into the United States during 1913 and 1914, were shown at the Exposition of Chemical Industries; but "at the behest of German dyestuffs importing interests" they were withdrawn, although later publication was ultimately promised by Secretary Redfield, and it appeared in November. The impossibility of obtaining synthetic indigo from Germany has led to the revival of the natural industry in India where efforts are now being made under scientific direction to obtain the maximum yield of indigo at the lowest cost so as to secure a permanent market for that dyestuff. On the other hand synthetic indigo is now being made in the United States to meet the increasing demand for this coloring material, which prior to the war was imported from Germany. An interesting feature of the progress of this industry was manifest by



the statement published in July that American manufacturers of coal tar and natural dyestuffs are adding to the foreign trade of New York at the rate of over \$200,000 a month. Detailed statistics of May exports showed that the value of colors of all kinds sent out in May totaled \$594,096, against \$380,612 in April. It was said that foreigners were paying pretty stiff tribute to domestic makers for the much desired dyes. Another incident of interest is the statement generally made that the German submarine *Deutschland* brought to the United States in July a cargo of chemicals and dyestuffs of sufficient value to have paid the cost of the building of the submarine. Less spectacular, but still of marked interest, has been the evolution in the use of natural dyestuffs by American manufacturers. The Bureau of the Census reports a domestic output of such dyes in 1914 valued at \$1,866,000. The chief constituent was logwood extract, amounting to 14,500 short tons, and valued at \$1,312,000. This represents an increase for this dyestuff of 32 per cent over the production of 1909. Other natural dyestuffs (quercitron, fustic, cutch, archil, etc.) increased in value from \$144,000 in 1914 to \$544,000 in 1915, or 285 per cent. The production of such mineral colors as chrome yellow, orange, and green, iron buff, Prussian blue, ultramarine, etc., amounted in 1914 to 2500 short tons, valued at \$594,000. The increase in the value of the output during the quinquennial period was 52 per cent. There has been no very noteworthy increase since 1914 in the manufacture of these wares, except of ultramarine, for which there had been a considerable dependence upon European sources prior to the war. See *Hearing to Establish the Manufacture of Dyestuffs Before the Committee on Ways and Means, 64th Congress, First Session* (248 pp., Washington, 1916). Also the "Dyestuff Situation in the United States at the Close of 1915," by Thomas H. Norton (*Journal of Industrial and Engineering Chemistry*, February, 1916).

**THE DYESTUFF SITUATION ABROAD.** From Great Britain comes the report that the British Dyes Company at Huddersfield is active and that new buildings were already needed. As England formerly sent the raw materials of aniline dyes to Germany to be returned as the finished product, so now she is sending raw materials to Switzerland and many British dye-users have signed contracts to continue the import of Swiss dyes after the war is over. So that while aniline dyes are being made in smaller factories in England they are also being imported from Switzerland in unprecedented quantities. However, the difficulty of obtaining adequate supplies of aniline colors has given a strong stimulus to the utilization of natural dyes. Dyestuffs in use prior to the advent of chemical dyes are receiving considerable attention. The sources of supply as well as the practical adaptability of such products are being subjected to careful analysis with a view toward more extensive use. Natural coloring matters susceptible of replacing synthetic dyes are eagerly sought. The opinion is expressed that a large and permanent trade in South and Central American natural dyestuffs, such as logwood, fustics, quercitrons, quebracho extracts, and hematines, could be built up with British industries if the proper steps were taken at the present juncture in connection with prices and deliveries. It is largely through the substi-

tution of natural tinctorial products and vegetable dyes of South America and India that the present deficiency in synthetic dyewares is being overcome. These conditions have naturally resulted in the advancement of prices for dyeing, sizing, and tinting. The general trend shows that in the future Great Britain will largely break away from its dependence on Germany and other countries so far as dye and fine chemicals are concerned.

From Switzerland the outlook is more satisfactory, for the Society of Chemical Industry in Basle reports that after laying aside \$535,000 as against \$175,000 last year, for depreciation, and the sum of \$195,000 for pensions for workmen, there was a net profit on the year's operations of \$496,000, as against \$350,000 the year before.

From France the shortage of dyestuff supplies is reported. Of greater import than any one factor in the conduct of the silk industry has been the dyestuff supplies. All the stocks that had been seized by the government at the outbreak of the war and distributed under the direction of the minister of war have been exhausted, and, while several organizations created research bureaus for the making of dyestuff factories and substitutes for German products, no material progress was made, and therefore the outlook is not bright. Should the war last much longer there is no doubt that the United States will have to furnish all the dyes or ingredients necessary for the few colors that are now being used in the Lyons silk industry.

In Germany the large chemical industries, on account of their adaptability to war conditions, have been able to declare large dividends. Notwithstanding the fact that the general conditions of the industry are regarded as satisfactory, the aniline color manufacturers, on account of the loss of the export trade, are not in a favorable condition. The prospects, as they appeared from orders coming at the close of 1915, were expected to improve in 1916. Notwithstanding efforts to content themselves with domestic orders, the diminution of exports is felt throughout the whole industry.

The Japanese were quick to take advantage of the situation and the encouragement given by the Japanese government to the manufacture in Japan of synthetic dyes and medicines has resulted in the formation of a company capitalized at nearly \$4,000,000, the capital stock of which was oversubscribed 870 times. Later it was reported that all the by-products of the Government Iron Works, the Mitsui Mining Co., the Mitsu Bishi Co., the Tokyo Gas Co., the Osaka Gas Co., and other factories were being fully used. The supply of coal tar exceeded 60,000 tons. In its distillation many large commercial interests were engaged. The foremost of these is the Nippon Dyestuff Co. It profits from government protection under the law for the encouragement of chemical and dyestuff industries, although the concern is still far from being in large operation. Gas companies in Osaka and Tokyo have taken up the manufacture as a subsidiary branch, as they have a good supply of coal tar at their disposal. Aniline salt and induline are marketed by the Tokyo Gas Co. The Mitsui Mining Co. has succeeded in producing a variety of dyes from coal tar by its works at Miike. Later this company hopes to extend the list of its products so as to include additional deriva-

tives of benzol, carboic acid, salicylic acid, and picric acid. Besides there are many minor enterprises engaged in this branch, including the Osaka Chemical Industry Co. and the Kobe Seikyo. These produce several artificial dyestuffs and are contributing much to the rapid development of the important new industry in that country. In July a report was issued showing the exports of dyestuffs from New York. It gave the following items: Italy, which in April was the largest buyer of American colors, in May yielded first place to Russia, which took colors worth \$260,720, Italy coming next with \$105,645. Color exports to Russia in Asia for May were \$3300. English requirements in May were \$62,516. In spite of the disturbed conditions in Mexico, color shipments to that country in May were \$41,500. France's share in May trade was \$29,587, and that of Spain was \$24,251. Brazil took colors worth \$13,334, Argentina \$13,172, and Chile \$5904. Portugal received \$11,177 worth of dyes in May, while Greece's purchases were valued at \$7027. Scottish shipments amounted to \$3443, British India \$1240, and Japan \$722. Australia bought American dyes valued at \$1281, while fair purchases were made by Cuba and other West Indian Islands.

**ASPHYXIATING GASES.** The information given under this heading in the *INTERNATIONAL YEAR BOOK* for 1915 (page 136) has been added to by reports from England in which it was claimed that the irritating influence of these gases is largely due to "Sabadilla," a plant of the lily family, botanically called "*Veratrum sabadilla* Retz." that occurs only in Venezuela and Mexico. The highly-poisonous seeds have long been used in medicine. The substances produced from sabadilla seed are cavadine, an alkaloid; veratric acid; and sabadalline. The last is an amorphous, pleasant smelling alkaloid that accelerates the beating of the heart. Sabadilla powder is used by cattle raisers in Venezuela as an insecticide with excellent results. It is said that in Europe it is used in the manufacture of disinfectants, and that in the Balkan states and Russia it is employed in tanning fine leathers and as a mordant for dyes.

**CHEMOTHERAPY.** See **TUBERCULOSIS.**

**CHENEY, CHARLES EDWARD.** Senior bishop of the Reformed Episcopal Church in America, died Nov. 15, 1916, in Chicago. He was born at Canandaigua, N. Y., in 1836. After graduating from Hobart College in 1857, he studied at the Alexandria (Va.) Theological Seminary, and was ordained in 1858. From 1860 till his death, he was rector of Christ Church, Chicago, except for a short period just after he had been deposed from the priesthood for refusing to use the word "regenerate" in the baptismal offices. Dr. Cheney then was instrumental in founding the Reformed Episcopal Church, of which he became assistant bishop and afterward bishop, and Christ Church was received into the new denomination. In 1905-07 he served as president of the Synod of the Reformed Episcopal Churches of the Middle States. He was the author of religious and historical works, including *What Do Reformed Episcopalians Believe?* (1888) and *The Second Norman Conquest of England* (1907).

**CHESS.** The Rice Memorial masters' tournament held in New York City was the feature of the year 1916 in chess circles. J. R. Capablanca proved the victor, winning 14 games and losing 3; D. Janowski of Paris finished second with 11

victories and 6 defeats, and O. Chages of New York City third with 10½ victories and 6½ defeats. Other results were: B. Kostic, Budapest, won 10, lost 7; A. Kupchik, New York City, won 10, lost 7; J. Rosenthal won 7½, lost 5½; J. Bernstein won 7, lost 6; A. W. Fox won 7, lost 6; A. Schroeder won 5½, lost 7½; R. T. Black won 5, lost 8; A. B. Hodges won 5, lost 8; I. Tenenwurzle won 3½, lost 9½; F. K. Perkins won 3, lost 10; N. W. Banks won 2, lost 11.

In the Rice Memorial international problem tourney, C. Promisio, Philadelphia, K. Grabowski, Warsaw, Russia, A. M. Sparke, Lincoln, Eng., Valentin Marin, Barcelona, Spain, and J. Rietveld, Kesteren, Netherlands, divided first, second, and third prizes. The contest in the three-move section also resulted in a tie between Emil Palkoska, Prague, Austria; Godfrey Heathcote, Arnside, Eng.; Valentin Marin, Barcelona, Spain; H. F. L. Meyer, London, Eng.; and J. Willner, Kishinev, Russia. Henri Rinck, Barcelona, Spain, and H. J. A. Drevitt, Oxford, Eng., tied for first in the end-game section.

J. R. Capablanca established a marvelous record during the year in a tour of the leading cities of the United States. He won 404 games, lost 5, and drew 10. Credit also should be given to Boris Kostic who, blindfolded, played 20 opponents at the Rice Progressive Chess Club, New York City, winning 19 games and drawing 1, in 6 hours, 11 minutes.

The Manhattan Chess Club won the championship of the Metropolitan Chess League, having a clean slate in six matches. The Rice Progressive Club finished second, and the Brooklyn Chess Club third. Columbia University again captured the inter-collegiate championship with 8 victories and 4 defeats. Yale was second with 6½ victories and 5½ defeats, Harvard third with 5½ victories and 6½ defeats, and Princeton last with 4 victories and 8 defeats.

A world's record for simultaneous play was made by F. J. Marshall, who out of 95 games won 80, lost 8, and drew 7.

**CHICAGO.** See **ILLINOIS; RAPID TRANSIT.**

**CHICAGO, UNIVERSITY OF.** A non-sectarian educational institution at Chicago, Ill., founded in 1891, largely through gifts made by John D. Rockefeller. It has since been greatly indebted to Mr. Rockefeller for its maintenance. The total registration in all departments of the university in the fall of 1916 was 4881. During the academic year 1915-16 it was 8510. On the teaching staff were 334 faculty members and 102 assistants. During the year Prof. J. Lawrence Laughlin, head of the department of political economy, retired. The following new appointments were made: Jean Piccard, of the University of Lausanne, Switzerland, as assistant professor of chemistry; E. W. Burgess, Ohio State University, assistant professor of sociology; Frederic C. Woodward, dean of Leland Stanford University, professor of law; H. A. Millis, of the University of Kansas, associate professor of political economy; Nathaniel Butler, dean of University College. During 1916 the university received property valued at between \$2,000,000 and \$2,500,000, from Hobart W. Williams of Chicago. Eventually the income from this gift will be devoted to assisting deserving students and to instruction in commercial and business studies. Ida Noyes Hall, built at a cost of nearly \$600,000, from funds largely contributed by Laverne Noyes, was dedicated in June, 1916.

It is being used as a club-house, gymnasium, and hall by women students. An anonymous donor gave \$200,000 for the divinity school. What John D. Rockefeller designated as his "final gift" to the university was \$10,000,000, to be paid in 10 annual installments, beginning in 1910. Of this amount, \$1,500,000 is shortly to be devoted, in accordance with Mr. Rockefeller's wishes, to the erection of a chapel. At the close of the spring quarter in 1916 the university celebrated its 25th anniversary. One of the most important projects ever planned by an American educational institution was announced late in 1916 by the University of Chicago. It is proposed to combine various medical institutions in Chicago, including Rush Medical College, the medical department of Northwestern University, and the medical department of Chicago University in one great central plant, under the control of the last-named institution, with the hope of making this second to none in the United States or in the world. (See UNIVERSITIES AND COLLEGES, *General Education Board*.) The productive funds of the university amount to about \$23,494,280, and the income to about \$1,292,185. In November, 1916, the library contained about 485,840 volumes. President, Harry P. Judson.

**CHICAGO ART INSTITUTE.** See PAINTING AND SCULPTURE.

**CHICAGO OPERA COMPANY.** See MUSIC, *Opera*.

**CHICAGO SYMPHONY ORCHESTRA.** See MUSIC, sections *Orchestras* and *Novelties*.

**CHILD LABOR.** The most important event with reference to the protection of child workers was the enactment of the Federal law known popularly as the Keating-Owen Bill. Some advance was made in the legislation of the Southern States, investigations were carried forward in different communities, and its educational propaganda was continued by the National Child Labor Committee.

This Committee introduced as a feature of its educational campaign a play entitled *A Pageant of Sunshine and Shadow*, written by Constance D. Mackay. This is a morality play, drawing contrasts between the lives of the children who work and those who enjoy the rights and opportunities of full development. Child Labor Day was celebrated on January 23rd by thousands of school teachers and superintendents, clergymen, women's clubs, and other organizations, as one feature of the agitation for the enactment of the Federal bill.

The Committee held a conference at Asheville, N. C., in February, the discussion having special reference to the proposed Federal law. The Southern Association of Cotton Manufacturers was represented. The conference showed that child labor is not an issue between the North and South, but between progressive people everywhere and the mill men. The sessions developed the belief that the true sentiment of the South has not yet been expressed in legislation, because three-fourths of the speakers were from the South and with few exceptions concurred in approving the Federal act and in demanding advanced legislation in Southern States.

**INVESTIGATIONS.** The National Child Labor Committee found through investigation that conditions of child labor in the sugar-beet fields of Colorado rival those of the cotton mills of the South. In the harvest season, children 6 years of age work in the fields from 5 A. M. to 7 P. M.

pulling beets, and miss on an average nearly two months of schooling each year. The amount of energy needed for the work is exhausting to a growing child, five tons of beets being topped daily by some of the child-laborers.

Drs. Lee K. Frankel and Louis I. Dublin made an investigation of 10,000 children who took out working papers in New York City between July, 1914, and April, 1915. They found that 53.7 per cent of the 10,043 children were boys, 46.3 per cent girls. Of the boys 61 per cent were English, Irish, or Scotch. Of the girls 52.4 per cent were Italians. About three-eighths of the entire group were from 14 to 14½ years of age; one-fourth from 14½ to 15 years; one-fourth from 15 to 15½ years; and a little more than one-eighth from 15½ to 16 years. Jews constituted 36.6 per cent of the total group; Italians, 18.3 per cent; native born of native parentage, 16.1 per cent; British, 10.9 per cent; Germans, 9.5 per cent. Of the girls 56.2 per cent and of the boys 59.2 per cent made use of the first opportunity, based on age and schooling, to secure working papers. Measurements of height and weight showed that the stronger children of the family were evidently chosen to be the first to go to work.

**CHILD ACTORS IN THE MOVIES.** The motion picture measure of New York passed this year largely through the efforts of the New York City Child Labor Committee is the first attempt made in any State to regulate child labor in the movies. It is an amendment to the penal law relative to the employment of minors in public entertainments and exhibits; it places children of motion picture studios on the same basis as children of the legitimate stage. Under this law a child may not be employed without the written consent of the mayor or president of the board of trustees of a village specifying the child's name and age, names and residence of parents or guardians, facts about the motion picture concern such as its name, place where child is to be used, name and character of photo play, number of hours and days to be engaged, and exact description of part to be portrayed by the child. Moreover forty-eight hours previous notice of the application must be given to the Society for the Prevention of Cruelty to Children, if there be one in the county, and a hearing held if requested.

The law went into effect in May, and until then any mother could let out her children to the management of a motion picture studio regardless of the demands on its health and strength, or the retarding of its education. Wages are good, \$1.50 to \$3 a day being the average paid. Hence there is a great temptation to the poor parent, and as almost 6.6 per cent of the cases investigated show the need for regulation, other States should follow New York in this move.

**THE FEDERAL CHILD LABOR LAW.** The Federal Child Labor Bill was introduced in Congress of 1915 as the Keating-Owen Bill, and after passing the House by an overwhelming vote, the bill was delayed in the Senate until killed by the objection of Senator Overman of North Carolina near the close of the session. In February, 1916, the bill again was passed by the House by big majority, and on April 6th was favorably reported upon by the Senate Committee on Interstate Commerce, then after some changes in the Senate, passed that body.

The bill as passed by the House prohibited the shipment in interstate commerce of the products of any establishment into which the labor of children in whole or part had entered. The Senate substitute prohibited an establishment, employing children below the standards fixed in the bill, from shipping its products in interstate commerce whether made by children or adults. Thus the House had put an embargo on the actual products made by children, while the Senate substitute closes the channels of interstate commerce to any establishment employing children under sub-standard conditions. It is agreed by the best constitutional lawyers of both the Senate and the House that the Senate bill is more clearly constitutional than the House bill. The bill becomes effective one year from date of its approval by the President on September 1st.

This law establishes a national minimum standard by excluding from interstate commerce the products of all mills, factories, canneries, workshops, mines, and quarries which violate any of the restrictions specified, but it leaves the individual State free to improve upon this standard. In so far as it broadens the freedom of action in progressive States by removing the danger that products of unregulated child labor of another State will enter its markets in competition with its more costly products, it imposes the necessity of progressive action upon the less progressive States. This is believed to be its most important effect, a stimulus to standardization of State legislation.

Section one of the law prohibits any producer, manufacturer, or dealer from shipping or delivering for shipment in interstate or foreign commerce the product of any mine or quarry "in which within thirty days prior to the time of the removal of such product therefrom children under the age of 16 have been employed." A similar prohibition applies to any mill, cannery, workshop, or factory employing children under the age of 14, or employing children between ages 14 and 16 more than 8 hours in any day or more than 6 days in any week, or after the hour of 7 o'clock in the evening, or before the hour of 6 o'clock in the morning. The law provides for an Administrative Board composed of the Attorney-General, the Secretary of Commerce, and the Secretary of Labor. This Board is authorized to prepare rules and instructions for the application of the law. A special protection for innocent shippers or dealers is inserted in the provision that any dealer may protect himself by procuring a guaranty issued by the original producer of the goods.

Much discussion centred around the 30-day clause, which seemed to permit evasion by the simple method of storing goods 30 days after production and before shipment. This possibility, however, depends entirely upon the rules established by the Administrative Board. Such rules might easily provide that "removal" should include the transportation of goods from the immediate place of production to any store-room or warehouse.

The law was expected to affect about 150,000 working children; of these one-third were employed under the age limits fixed (27,000 in factories and 17,000 in mines and quarries), and the remainder were employed more than 8 hours per day. The law was attacked by child labor legislation enthusiasts on the ground that it did

not reach at least 1,850,000 children now employed as street vendors, as cotton pickers in Mississippi, Oklahoma, and Texas, as truck gardeners in Pennsylvania, New Jersey, Ohio, Colorado, and Maryland, as domestic servants, as cash girls, and as State wards. All such, however, are beyond Congressional control since their labor is too remotely related to interstate commerce. Moreover the value of the law as a protective measure is realized when it is known that 28 States have not enacted an 8-hour law for children and 13 States permit children to work at night.

Other legislation included the enactment in February by the South Carolina Legislature of a law raising the age limit to 14 years. Georgia and Alabama had previously passed laws similar to the Federal bill in spite of the opposition of cotton mill owners. These enactments left North Carolina alone of the Southern cotton manufacturing States with no adequate protective legislation. A new Maryland law effective June 1st substituted a Board of Labor and Statistics for the Bureau of Statistics and Information; it established a minimum age of 12 years for canneries and newspaper selling; it limited the hours of all children under 16 to 8 per day, between 7 A. M. and 7 P. M., and to 48 per week. It prohibited the employment of children under 16 in work on the stage, in theatres, moving picture houses, tobacco factories, and in the operation of dangerous machinery.

**GREAT BRITAIN.** The war produced such a scarcity of labor that there occurred a very marked increase in juvenile employment in Great Britain. Juvenile Employment Committees found it impossible to meet the demands for child labor. It was estimated that 45,000 children of ages 12 to 15 in excess of the normal number permanently left school for employment in 1915. Moreover, additional thousands were given longer or shorter periods of leave from school to engage in industry. At least 15,000 were excused for agricultural employment alone. The Board of Education pointed out that these facts indicated that the education of the children of Great Britain was being arrested and that they were being exposed to severe physical strain. They recommended increased care in physical examinations and the issuance of certificates, and more complete coöperation between employment committees and school medical authorities with a view to placing children in vocations suited to their abilities.

**Bibliography.** Among the considerable volume of literature on this subject reference may here be given to the following: L. K. Frankel and L. I. Dublin, *Heights and Weights of N. Y. City Children 14 to 16 Years of Age*; T. I. Parkinon, *Brief for the Keating-Owen Bill*; W. H. Singerland, *Child Welfare Work in California*; and the reports of the National Child Labor Committee, Maryland Bureau of Statistics and Information, Massachusetts Bureau of Statistics (*Industrial Home Work in Mass.*), and the New Hampshire Department of Public Instruction.

**CHILDREN'S COURTS.** See JUVENILE COURTS.

**CHILE.** A South American republic south of Peru and between the Pacific on the west and Bolivia and Argentina on the east. Capital, Santiago.

**AREA AND POPULATION.** The area of the 23 provinces and one territory into which the re-

public is divided is officially estimated at 757,366 square kilometers (292,419 square miles). Its length from the Peruvian boundary to the southern limits of South America is about 4230 kilometers (2628 miles); its width, though varying, may be stated as approximately 285 kilometers (177 miles). The population, according to the census of Nov. 27, 1907, was 3,249,279 (1,624,221 males, 1,625,058 females). The estimated population Dec. 31, 1914, was 3,596,541. About one-fourth of the people are of pure Spanish stock, and the remainder either mestizo or pure Indian. The principal cities, with estimated 1914 population: Santiago, 397,941; Valparaíso, 187,240; Concepción, 69,776; Iquique, 45,012; Talca, 39,526; Chillán, 39,173; Antofagasta, 36,114; Viña del Mar, 30,245; Temuco, 26,172; Talcahuano, 20,641; Curicó, 19,529; Valdivia, 19,388.

The number of marriages reported for 1913 was 21,341, and for 1914 19,002; living births, 140,525 and 136,660; deaths (exclusive of stillbirths), 107,200 and 100,069; excess of births, 33,325 and 36,491. Immigration, though encouraged by the government, is small; in 1911 863, in 1912 1839; in the decade 1905-14, 25,544.

Primary instruction is free, but not compulsory, and the average school attendance is low. Public primary schools in 1914 numbered 3040 with about 318,000 pupils, and private primary schools 483 with about 57,000 pupils. There were 12 public and 7 private higher grade schools, with 2457 and 828 students; 86 public and 117 private secondary schools with about 25,000 and 17,000 students respectively. In addition, there are normal, commercial, technical, and professional schools. There are two universities, which, in 1914, had about 4000 students. Roman Catholicism is the established religion, but the exercise of other forms of worship is tolerated.

**PRODUCTION.** In 1912 1.62 per cent of the area of the country was under cultivation, and of the cultivated area 47.4 per cent was planted to cereals. Wheat production, as reported for 1915, amounted to 5,171,545 metric quintals; oats, 1,031,230; barley, 816,441; beans, 510,668; corn, 462,819; potatoes, 2,580,491. Other products are wine, tobacco, sugar beets, honey, and wool. The latest available figures for live stock relate to 1913, when horses numbered 457,845; mules, 38,193; asses, 32,982; cattle, 1,968,620; sheep, 4,602,317; goats, 299,381; swine, 221,384. In recent years sheep grazing has developed notably in Magallanes Territory, at the far south.

Of Chile's mineral resources, by far the most important is sodium nitrate, produced in the arid north, in the provinces of Antofagasta and Tarapacá, and used in many parts of the civilized world as a fertilizer. The export tax on nitrate provides a large part of the national revenue. The mining of coal is of next importance to that of nitrate, but the output falls considerably short of the domestic demand. Anthracite is mined to some extent, but the high cost of production renders successful competition with similar foreign coal impossible. The production of copper, for which Chile was once famous, greatly declined, but now shows a renewed development. Other minerals exploited to some extent are gold, silver, manganese, cobalt, borate, salt, sulphur, and guano. Large iron deposits await development, and petroleum in presumably pay-

ing quantities has recently been discovered in Magallanes Territory.

**COMMERCE.** The reported value of imports in 1915 was 153,211,557 pesos gold, as compared with 269,756,699 in 1914; exports, 322,209,218 pesos, as compared with 299,676,435. The gold peso is worth 18d. sterling, or approximately 36.5 cents. On this basis, the value of imports and exports has been as follows, in thousands of dollars:

	1911	1912	1913	1914	1915
Imports	127,381	122,076	120,274	98,461	55,922
Exports	123,884	139,878	144,653	109,382	117,606

The great war caused a sharp decline in trade through the suspension of Chile's credit in Europe and the destruction of important markets. In 1914, the larger classified imports were as follows in thousands of dollars: Oils, varnishes, paints, and coal, 18,475; textiles, 17,838; mineral products, 15,973; vegetable products, 14,162; machinery, tools, apparatus, etc., 11,193; arms, ammunition, and explosives, 8639. Classified exports in 1914, in thousands of dollars: Mineral products, 93,208; animal products, 7966; vegetable products, 6082; foreign merchandise exported, 1954; beverages, 64; miscellaneous, 106. The preponderance of nitrate as an export may be seen in the fact that in 1913, when the total export value was 396,310,443 pesos gold, the value of the nitrate export was 305,354,000 pesos gold. Other exports in 1913, in thousands of pesos gold: Copper, 28,804; wool, 9493; hides and leather, 6674; wheat, 6320; borate of lime, 5882; meat, 5385; iodine, 5134; oats, 3467; beans, 1866; nuts, 1485; whale oil, 1312; bran, 1142.

Trade by principal countries, in thousands of dollars:

	Imports		Exports	
	1914	1915	1914	1915
United States	20,149	18,688	31,484	50,190
United Kingdom	22,809	18,809	40,041	40,582
Germany	25,890	8,584	18,079	.....
British India	1,979	2,769	.....	.....
Italy	1,977	1,738	788	1,709
France	4,206	1,700	4,245	8,554
Australia	6,269	1,204	155	1,972
Egypt	.....	.....	1,042	2,388
Total, incl. others	98,461	55,922	109,382	117,606

**COMMUNICATIONS.** The following is taken from a monograph published in 1916 by the Pan American Union: "The total of railways in operation at the end of 1915 was 5888 miles (9476 kilometers). There are other lines now under construction which will bring the railways to a total of 6166 miles (9923 kilometers), including government and private-owned lines. These private lines are principally short railways running from coast ports into the interior, to carry nitrates and other mineral products for shipment abroad. There is, however, among them the trans-Andean, via Juncal, which joins Valparaíso and Santiago (from Llai-Llai) with Mendoza [Argentina], through connection having been inaugurated in 1910; and the International Railway from Antofagasta into Bolivia to Oruro and La Paz [718 miles, or 1155 kilometers]. The great trunk line of the government system is the Longitudinal, called the Central, between Santiago and Valparaíso, 116 miles (187 kilometers), and between Santiago and

Puerto Montt, 751 miles (1208 kilometers), the southern portion of this, from Osorno to Puerto Montt, having been opened to traffic in the early months of 1913. The Longitudinal Railway north of Valparaiso is at present open to Antofagasta and beyond. Another important government railway, built with the coöperation of Bolivia, connects Arica with La Paz [278 miles, or 447 kilometers], thus offering . . . a short line between the highlands and the coast. This road was opened to traffic during 1913. . . . The Chilean government is projecting the electrification of the section uniting Santiago and Valparaiso, the motive power from the river Aconcagua to be used, and as there are numerous rivers flowing westward from the Andes, power can with little difficulty be obtained for the electrification of the entire system south of Santiago. Development for the next few years contemplates the construction of two new trans-Andean railways to connect Chile and Argentina. One of these is planned through the mountains about 300 miles north of Santiago, and the other about 400 miles to the south of the capital. The north line will bring into close touch the nitrate fields of Chile and the agricultural sections of Argentina, to the advantage of both."

During the year 1916 the Chilean government granted a concession to the Potrerillos Railway Co. (Ltd.) for a branch railway from the Chañaral line to the stream of El Barquito, and official approval was given to the transfer from William Braden to the Potrerillos Railway of a concession to construct and operate a branch line from the State Railway near Pueblo Hundido to the mining district of Potrerillos in the Department of Chañaral. Government permission was granted to Emilio A. Carrasco to construct a branch line from the Antofagasta-Bolivia railway, uniting the station Salinas with the nitrate deposits, Los Penitentes and Carabana. The government also granted to Alfredo Aldunate and Felix von J. Marteville permission to construct and exploit an electric railway between La Union, Rio Bueno, and Filuco, and a branch line from Rio Bueno to Lago Rauco.

During the year the construction of the Chilean end of a new trans-Andean railway was seriously discussed by the government which desired its early building. It was to connect the port of Bahia Blanca in Argentina with Lebu and was to cross the Andes in Lonquimay. On the Argentine side the new transcontinental line had been constructed within 20 miles of the Chilean frontier and was halted to wait for similar development on the western slope. The first Trans-Andean road crosses the mountains through the Uspallata Pass, 12,000 feet above sea level and before the great European war a twice a week train service was maintained between Buenos Aires and Valparaiso. This was discontinued until late in the year 1916 when it was resumed as a profitable passenger traffic had been developed as a result of the operation of the Panama Canal.

Telegraphs as reported for the end of 1914: line, 18,181 miles; wire, 32,942 miles; offices, 946. A radiotelegraph system has been installed, with stations at Arica, Antofagasta, Coquimbo, Valparaiso, Talcahuano, Valdivia, Puerto Montt, Juan Fernández Islands, Frutillar (on Lake Llanquihue), and Punta Arenas. Telephone line in 1914, 44,149 miles; wire, 55,589 miles. Post offices, over 1100.

**FINANCE.** The monetary unit is the peso; its par value is 18d. sterling, or approximately 36.5 cents. The paper peso fluctuates in value; in 1915 and 1916 it was worth about 14 cents. For 1916 the estimated revenue was 81,516,000 pesos gold and 115,103,000 pesos paper. The estimated export duties on nitrate amounted to 77,740,000 pesos gold, and estimated import duties to 63,000,000 pesos paper. The revenue for 1914 was reported at 60,581,378 pesos gold and 161,428,664 pesos paper; the expenditure, 65,692,992 gold and 220,321,006 paper. Principal departmental disbursements in 1914: interior, 403,307 pesos gold and 44,326,019 pesos paper; finance, 37,787,359 and 17,223,391; public instruction, 257,788 and 36,974,403; war, 398,388 and 41,770,985; marine, 7,907,755 and 18,452,073; industry and public works, 151,527 and 22,081,396; railways, 4,878,995 and 10,870,036; extraordinary expenditure, 12,491,733 and 13,597,817.

The foreign debt on Dec. 31, 1915, stood at £34,556,380, as compared with £33,277,040 on Dec. 31, 1914. On the latter date, the internal debt amounted to 155,722,335 pesos gold and 34,252,611 pesos paper.

**NAVY.** Besides various small and auxiliary craft, among which are about a dozen destroyers, 5 torpedo boats, and 2 submarines, the navy includes: 2 old battleships, the *Capitán Prat* (1892) and the *O'Higgins* (1897), aggregating 15,600 tons; 1 armored cruiser, the *Esmeralda* (1896), of 7000 tons; 4 protected cruisers (1890 to 1899), aggregating 14,500 tons. Two dreadnoughts building in England for Chile when the great war began were taken over by the British Admiralty.

**GOVERNMENT.** The executive authority is vested in a president, who is elected indirectly for five years and is ineligible for the next term. He is assisted by a council of state and by a cabinet. The council consists of 11 members, 6 chosen by the Congress and 5 by the President. The cabinet ministers are appointed by the President and are responsible to the Congress. The latter body consists of the Senate and the Chamber of Deputies. Senators (37 in number) are elected for six years, and deputies (118) for three years. The President for the term ending Dec. 23, 1920, is Juan Luis Sanfuentes, who succeeded Ramón Barros Luco.

**HISTORY.** At the close of the year 1915 the outcome of the serious ministerial crisis which had occurred in November was still unknown. It had arisen from the demand for a coalition or national ministry and the Opposition had shown itself in strength as early as November 2nd, but nothing was done on account of the disagreement between the two Houses. A few days before the expiration of President Luco's term, a ministry was made up of his supporters, but this gave way about a week later when the new president was installed, and another ministry was formed; but this in turn fell from power on December 31st, the Senate voting against it. On January 12th a new cabinet was formed on coalition principles under Señor Maximiliano Ibañez. In March, according to the official reports, the general conditions in trade and industry had greatly improved, the stringency at the beginning of the war having come to an end. It was said that the loss sustained on account of the cessation of copper and nitrate exportation to Teutonic countries had been made good

by their exportation to other countries. Economy, public and private, had not only averted a financial crisis, but made it unnecessary to draw on the fund held for the conversion of the peso currency.

**CHINA.** The Chinese Republic dates from Feb. 12, 1912, when, by an edict of the Empress Dowager, the infant emperor Pu-yi abdicated the throne and brought the Manchu dynasty to an end. The dynasty dated from 1644. Pu-yi, who was permitted to retain the title of Manchu Emperor, was born Feb. 11, 1906. The capital of the republic is Peking.

**AREA AND POPULATION.** The estimated area of the republic is about 4,278,000 square miles, of which China proper ("the eighteen provinces") comprises 1,532,789 square miles. Besides China proper, the republic includes Manchuria (three provinces), Mongolia (Inner and Outer), Tibet, and Sinkiang (which includes East Turkestan and is now called a province). The degree of authority which the government at Peking exercises in Mongolia and Tibet is variable, and the autonomy of Outer Mongolia is recognized in a Chinese-Russian convention signed in October, 1913. Various estimates or enumerations of the populations dwelling within the limits of the republic have been made under governmental authority, but with so complete an ignorance of statistical method that they command little confidence. There is reason to believe, however, that the traditional 400,000,000 is excessive and that the returns of the so-called census of 1910, which was really an enumeration of households, disclose fairly well the number of inhabitants. The population of China proper seems to be increasing very slowly or perhaps not at all. The number of inhabitants

as calculated from the 1910 enumeration of households is shown below. The figures do not include children under six years of age; these are estimated at 9,000,000. In the case of Szechwan, a figure reported by the viceroy, and regarded as more nearly accurate than the census figure, has been substituted. In addition to area and population, the table gives the provincial capitals.

Much uncertainty exists with respect to urban populations. A calculation based on the 1910 enumeration gave Peking about 821,000 inhabitants; but according to the reported results of a 1912 enumeration, the inhabitants numbered only about 692,500. Estimated population of some of the larger treaty ports: Hankow, 1,321,000; Canton, 900,000; Tientsin, 800,000; Chungking, 702,000; Shanghai, 651,000; Foochow, 624,000; Soochow, 500,000; Ningpo, 455,000; Nanking, 377,000; Changsha, 250,000; Chinkiang, 186,000; Amoy, 114,000; Shasi, 105,000; Wenchow, 100,000. The reported number of foreigners resident in the open ports in 1914 was 164,807, including 84,948 Japanese, 56,319 Russians, 8914 British, 4365 Americans, 3188 Portuguese, 3013 Germans, and 1864 French.

**RELIGION AND EDUCATION.** Ancestor worship is observed by virtually all the people, most of whom acknowledge as their religion either Confucianism, Taoism, or Buddhism. Under the republic no ecclesiastical hierarchy is maintained, but Confucianism is regarded as the basis of ethical teaching in the system of national education. The number of Mohammedans is probably between 5,000,000 and 10,000,000. Roman Catholic natives were reported to number 1,531,216 in 1912; Protestant natives, 356,209 in 1913.

The estimated number of educational institutions of all kinds is about 58,000, with an enrollment of about 1,600,000 pupils and students. In 1905 the government undertook the gradual introduction of Western learning, with the result that the traditional education in the Chinese classics is being widely superseded by more practical instruction. The Imperial University at Peking and the university at Tientsin have European and Japanese in addition to Chinese professors. At Peking is an important medical school.

**INDUSTRIES.** The principal crops, in the north, include wheat, barley, corn, millet, and other cereals, and beans and peas; and in the south, rice, sugar-cane, indigo, cotton. In the south and west, important products are tea and silk cocoons, the latter being produced to some extent in all the provinces. Many kinds of fruit are cultivated. Opium was formerly produced in large quantities, but the output, as well as the importation from India, has been greatly restricted; no Indian opium may be brought into any Chinese province which has succeeded in suppressing poppy cultivation.

China's mineral deposits are rich and extensive, but in general they have been little exploited. The coal deposits, which are worked to some extent, are known to be among the richest in the world. Of the other minerals worked, the more important are tin (in Yunnan), iron (which is abundant in many localities), copper (in Yunnan), antimony (Hunan), lead, zinc, and salt.

The leading manufactures are cotton, silk, and woolen goods. At the end of 1914, 45 mills, with 1,200,000 spindles, were reported in

	Sq. miles	Pop.	Capital
Anhui	54,826	14,077,683	Anking
Chekiang	36,680	18,924,655	Hangchow
Chihli	115,880	22,970,654	Paotingfu
Fukien	46,332	8,555,678	Foochow
Honan	67,954	22,375,516	Kaifeng
Hunan	83,898	20,538,187	Changsha
Hupeh	71,428	21,256,144	Wuchang
Kansu	125,483	3,807,883	Lanchowfu
Kiangsi	69,498	16,254,374	Nanchang
Kiangsu	38,610	15,379,042	Nanking
Kwangsi	77,220	5,426,356	Kwellin
Kwangtung	99,970	23,696,866	Canton
Kweichow	67,182	9,266,914	Kweiyang
Shansi	81,853	9,422,871	Taiyuanfu
Shantung	55,984	25,818,685	Tsinan
Shensi	75,290	6,726,064	Sciianfu
Szechwan	218,538	54,505,600	Chengtu
Yunnan	146,718	8,049,672	Yunanfu
China proper..	1,532,789	*802,111,334	Peking
Heilungkiang ...	202,703	1,562,254	Tsitaihar
Kirin .....	105,019	5,349,287	Kirin
Shengking .....	54,761	5,880,819	Mukden
Manchuria ....	362,488	*12,742,360	
Sinkiang .....	550,579	*1,768,560	Tihwahfu
Tibetan marches (of Szechwan and Yunnan)	.....	195,496	
Children under six years (esti- mated) .....	.....	9,000,000	
Total provinces.	2,445,851	825,817,750	
Mongolia .....	1,076,292	1,800,000	
Tibet † .....	756,000	12,000,000	
Grand total....	4,278,143	829,617,750	Urga Lhaasa

\* Not including children under six years. † Including Koko-Nor and Tsaidam. ‡ Estimate.

operation. There is some manufacture of iron and steel, especially at Hanyang, near Hankow. Modern flour and rice mills have been established in various places.

**COMMERCE.** The value of the haikwan tael, in terms of which the Chinese foreign trade is reported, was about 65 cents in 1911, 74 cents in 1912, 73 cents in 1913, and 66.4 cents in 1914. The table below shows general imports and general exports of merchandise and also the special trade (that is, imports for consumption and exports of Chinese produce), values being stated in thousands of haikwan taels:

General trade:	1911	1912	1913	1914
Imports	482,576	485,726	586,290	572,058
Exports	388,410	383,149	419,483	360,280
<b>Special trade:</b>				
Imports	471,504	473,097	570,163	557,109
Exports	377,338	370,520	403,306	345,281

In 1913 and 1914 respectively, the principal imports for consumption were valued as follows, in thousands of haikwan taels: cotton fabrics, 109,882 and 111,168; cotton yarn, 72,537 and 67,091; opium, 41,023 and 37,345; petroleum, 25,403 and 34,433; sugar, 36,464 and 30,372; rice, 18,384 and 21,843; tobacco, 16,891 and 16,299; dyes, etc., 17,511 and 14,180; fish, 12,975 and 13,189; iron, 13,352 and 11,759; flour, 10,301 and 9017; machinery, 7930 and 8494; coal, 9492 and 8449; timber, 6687 and 8154; copper, 6738 and 7527; paper, 7169 and 6471; leather, 7179 and 5972. Principal exports of Chinese produce in 1913 and 1914 respectively, valued in thousands of haikwan taels: raw silk and waste, 83,156 and 63,297; beans and bean cake, 48,458 and 47,078; tea, 33,937 and 36,452; silk manufactures, 21,719 and 16,265; hides and skins, 19,789 and 16,081; cotton, 16,587 and 12,629; oils, 12,609 and 13,184; coal, 6593 and 8711; tin, 10,917 and 8165; wool, 6656 and 7685; wheat, 9514 and 7374; sesame, 12,372 and 6355; live animals, 6731 and 5271; silks, 4435 and 4348; eggs, 4193 in 1914. The large bean export consists chiefly of the soy bean, which is the leading crop of Manchuria. The tea export in 1913 amounted to 192,181,200 lbs.; in 1914, 199,439,700, of which 120,362,133 lbs. to Russia, 22,736,133 lbs. to the United States, 18,772,666 lbs. to the United Kingdom, and 13,597,600 lbs. to Hongkong.

Trade by countries has been as follows, in thousands of haikwan taels:

	Imports		Exports	
	1913	1914	1913	1914
Hongkong	171,686	164,449	117,129	98,400
Japan	119,347	120,687	65,544	63,477
United Kingdom	96,911	104,984	16,846	22,017
United States	85,427	40,783	37,650	39,861
British India	48,292	39,135	6,190	6,777
Russia	22,153	21,916	44,921	41,494
Belgium	15,831	17,583	6,546	5,055
Germany	28,302	14,104	17,025	10,273
Straits Settlements	8,935	7,557	7,553	6,953
Du. E. Indies	6,837	6,591	2,605	2,922
Macao	6,596	5,940	4,952	4,216
Indo-China	4,782	5,618	1,887	1,808
France	5,300	4,939	40,750	22,862
Korea	3,527	4,500	6,818	4,944
Austria-Hungary	4,122	2,291	1,550	1,201
Netherlands	1,424	1,855	8,692	4,670
British America	1,866	1,167	652	794
Italy	664	776	8,318	5,288
Others	4,388	7,483	7,973	7,269
Total	586,290	572,058	403,306	345,281
Re-exportation	16,128	14,949	.....	.....
Total net	570,163	557,109	403,306	345,281

**SHIPPING.** Vessels entered and cleared at Chinese ports in 1914 numbered 219,649, of 96,326,267 tons, as compared with 190,738, of 93,334,830 tons, in 1913. Of the 1914 shipping, steamers numbered 107,178, of 89,469,882 tons, and sail 112,471, of 6,856,395 tons. Under the Chinese flag were 150,727 vessels, of 24,931,226 tons; British, 32,705, of 38,795,409 tons; Japanese, 22,143, of 23,684,774 tons; German, 3593, of 3,328,597 tons; American, 3116, of 1,017,492 tons; French, 516, of 882,440 tons. In the direct foreign trade, there were entered and cleared in 1913 74,081 vessels, of 29,150,871 tons.

**COMMUNICATIONS.** The roads of China proper are numerous and, though most of them are in poor condition, they carry a large internal trade. Commercially more important than the roads are the many canals and navigable rivers. The reported length of railway in operation at the beginning of 1914 was 5960 miles, including the Manchurian railways; under construction, 2273 miles. One of the most important developments of the national idea in China was the policy of making a system of state railways, and a system of trunk lines which should be constructed and operated by the government was carefully mapped out.

At the end of 1915, there were in all 5184 miles of railway under operation, of which the most important was the system of government railways, which comprised 15 different lines with a total of 3543 miles, thus equaling 68.4 per cent of the total kilometrage in the country. The second class embraced 1490 miles of "concessioned" lines such as the Chinese Eastern, the South-Manchuria, and the Chiaoohou-Tainan Lines; while the last class consisted of 150.4 miles of private lines which were owned and operated by private Chinese companies. This system of government railways up to 1915 cost the Chinese government \$398,221,176, being about \$73,783 per kilometer of line.

There were 627 locomotives of all classes which were brought from more than five different countries. A total of 823 passenger cars and 10,418 goods wagons were used in carrying the 26,036,152 passengers and 14,580,264 tons of freight in 1915. A gross revenue of 56.1 million dollars was earned, while 48 millions were spent for doing the business and paying interest on the capital, leaving \$8,100,000 to the government as a net profit during the same period. In addition to the lines under operation, there were in 1916 about 6200 miles of line either under construction or definitely projected.

The Southern Manchuria Railway, a company operating under a concession, was engaged on construction work on the Ssuningkai-Chengchiatum section of the Ssuningkai-Taonanfu Railway under the terms of a preliminary agreement concluded by China and Japan in 1913. The first section to be constructed was to be 65 miles in length. The whole line was to be 165 miles in length, and feed the Southern Manchuria Railway. A loan agreement was negotiated during the year providing for the construction of the first section at an estimated cost of \$1,500,000.

Another important line on which construction was in active progress in 1916 was the 300-mile stretch on the Canton-Hankau Railway from Hankau to Changsha. On this line track had been laid at both ends, and also at Yochow,



the section under construction representing that part of a larger project which had survived various political and financial difficulties. The Canton-Hankau Railway forms the southern half of the line connecting Canton and Hongkong with Peking, and, by means of the Trans-Siberian Railway, with Europe.

In October, 1916, it was announced that the Siems-Carey Railway and Canal Co., an American corporation, had concluded a contract to build 1100 miles of railway for the Chinese government. This corporation was controlled jointly by the American International Corporation of New York City, and Messrs. Siems & Carey of St. Paul, Minn., the former corporation having already advanced \$500,000 to cover the cost of preliminary surveys and investigations. This corporation was also to finance the construction by the sale of Chinese government bonds, and the contract provided that the railway lines were to be built at cost plus a percentage. The location and construction was to be in charge of an American chief engineer, who was to supervise the operation of the lines when completed, and Americans were also to be employed at the head of the auditing and traffic departments.

As showing the use of railways in China, mention may be made of the Canton-Samshui Railway, a line only 30 miles in length, which carried during 1915, 4,167,673 passengers and 8187 tons of freight. The total receipts of the line were \$302,636. It is considered to be one of the best paying lines in China for its size, as it connects Canton with Fatsshan, a city of some 600,000 population, distant only about 12 miles, and passes through a well populated territory. No new roadbed was constructed during the year, but new station buildings, platforms and turntables were erected and other improvements were made.

The telegraphic system, which is under government control, connects the principal cities with each other and with the neighboring countries. At the end of 1914, there were 36,339 miles of line, 49,963 miles of wire, and 561 offices. Several radiotelegraph stations have been installed. The postal system extends over China proper, Manchuria, and Sinkiang; in 1914, in which year China joined the postal union, the number of post offices was 8324.

**FINANCE.** The estimated ordinary revenue, according to the budget for 1916, was 426,000,000 taels; extraordinary revenue, 40,000,000 taels; total, 472,000,000 taels. The estimated expenditure equaled the estimated revenue, the figure for ordinary expenditure being 286,000,000 taels, and for extraordinary expenditure 186,000,000 taels. Revenue derived from the foreign trade is collected by the Chinese maritime customs, administered by a British inspector-general. Receipts from maritime customs and from opium likin respectively were 37,819,312 and 1,598,218 taels in 1914, as compared with 40,150,720 and 3,819,133 taels in 1913. The haikwan, or maritime customs, tael was valued at about 73 cents in 1913, 66.4 cents in 1914, and 59 cents in 1915. The reported foreign debt at the end of 1914 was about £173,494,000.

**NAVY.** The only serviceable vessels, aside from small craft, are six protected cruisers. Four of them (one, the *Hai Chi*, of 4300 tons), and three of about 3000 tons each were built in

1897 and 1898. The cruisers *Ying Swei* and *Chao Ho*, of 2400 tons each, were completed at Barrow and Elswick respectively in 1912. There are several destroyers, torpedo boats, sea-going gunboats, and river gunboats. The Chinese dockyards are inadequate, no proper naval bases exist, and the small and partly antiquated fleet is lacking in uniformity.

**GOVERNMENT.** The Chinese Republic, established Feb. 12, 1912, upon the abdication of the infant emperor Pu-yi, was recognized by the United States May 2, 1913, and by other powers Oct. 6, 1913. On Feb. 15, 1912, Yuan Shih Kai was declared provisional President; he was elected Oct. 6, 1913, and inaugurated October 10th as the first constitutional President, for the term 1913-18. On May 1, 1914, a new constitution was proclaimed, and on December 29th an edict was promulgated extending the President's term to ten years. At the end of 1915, it was announced that Yuan, upon the advice of the Council of State, had decided to declare himself emperor. An anti-monarchical revolt broke out in Southern China, and in the winter and spring of 1916 several provinces asserted their secession and independence. Yuan continued as President of the republic and in June he died. See below, *History*. The Council of State, numbering 50 to 70 members, appointed by the President, acts as an advisory, administrative, and legislative body pending the election and organization of the future Parliament.

#### HISTORY

**RESTORATION OF THE REPUBLIC.** Toward the end of December, 1915, a revolutionary movement broke out in Yunnan and it soon spread to the four neighboring provinces. At first Yuan Shih Kai (q.v.) declared it could be easily put down, but on January 21st, it was announced that the coronation which had been fixed for a date in February, was indefinitely postponed. The chief cause of the revolt was dissatisfaction with the measures of Yuan Shih Kai, especially his attempt to raise himself to the throne. At the very beginning of the monarchical movement the discontent began to show itself, and after foreign governments had advised Yuan Shih Kai to defer the restoration of the monarchy the rebels gained courage. This movement was thought to have originated in Peking. At first the forces included some 30,000 troops of the regular army, and the leader in the early stages was Tsai Ao. By the middle of January it was reported that while the government had had some success against the revolutionaries early in the month the latter with an army 60,000 strong had defeated Yuan Shih Kai's troops in the Province of Szechwan. By the end of the month the Yunnan rebels were reported to be steadily advancing into this province, and the number of the insurgents at all points to be increasing. Although according to reports the government still had matters under control, the revolution continued to make progress in February, Mongol troops having crossed the Great Wall on February 1st, and Lu-Chow having fallen into the hands of the revolutionists on February 10th. Reports that the government was still sure of holding its own were soon followed on March 21st with the announcement that Yuan Shih Kai had decided to abandon his royal projects and to return to the of-

rice of president, maintaining the republican form of government, and at about the same time Hsu Shi Chang, who in disapproval of the monarchy had resigned from the cabinet, returned to it as secretary of state. Yuan declared that his only reason for consenting to the demands for a monarchy had been the insistence of the public representatives and that he had not taken any measures to restore the monarchy, but he blamed himself for not opposing the movement more forcibly. The laws reestablishing the monarchy were repealed and the republic was reinstated at the meeting of the State Council March 27th. In spite of this concession the activity of the revolutionists continued and by the end of March important points in the Province of Szechwan and elsewhere fell into their hands, while a considerable part of Southern China joined the movement. The revolutionary movement continued to make head during April. On April 6th, Canton, in the Province of Kwang-tung, was declared independent; on April 12th, the Province of Che-King was declared independent and on April 13th, the governor of the Province of Kiang-si declared its independence of the central authority. By May the revolution had divided the country into two divisions, of which only the north was loyal. In South China only one province out of eight remained loyal and it seemed to be loyal in name only. The five provinces of Middle China were disaffected, and according to reports even North China was wavering. Meanwhile on April 22nd the President, admitting that his assumption of power had caused dissatisfaction, authorized the appointment of a responsible cabinet, with Tuan Chi-jui as prime minister and minister of war, and the new ministry was organized on April 24th. The President agreed to turn over to it the civil authority. This concession, however, did not allay the discontent. At a meeting of the National Assembly 216 members voted resolutions condemning the President's action, and rejecting any terms of settlement that retained Yuan Shih Kai as president. All through May the revolutionists continued to make progress and there were occasional collisions between the two parties. A conference called at Nanking on May 27th for the purpose of making a settlement came to nothing and was dissolved. On June 6th, occurred the death of Yuan Shih Kai at his palace at Peking after an illness of a few days. The official announcement gave uræmia as the cause, but rumors were circulated that he had committed suicide or been poisoned. According to reports he had expressed regret just before his death at his part in the monarchical movement. His funeral took place on June 26th.

The Vice-President, Li Yuan-hung, who had been a republican general in command of the revolutionists in 1911, succeeded to the presidency. He proclaimed an amnesty, changed the personnel of the cabinet, and ordered the assembling of Parliament at an early date to reorganize the constitution.

Matters improved somewhat after the end of June, and the country remained during the following month, for the most part, quiet, but there were outbreaks in Canton and Hankow. In the former city the revolutionary general came into conflict with the governor's troops, the residents having been armed to put an end

to his administration. In Hankow the leaders of the radical revolutionary party directed an attack upon the authorities which led to much pillage and the killing of natives for the apparent purpose of intimidating the central government. It was hoped that by so doing Parliament, which was to meet on August 1st, would pay more attention to the demands of the radical element.

**PARLIAMENT.** Parliament met on August 1st, for the installation of the government, and as soon as that was accomplished it adjourned. The President, Li Yuan-hung (q.v.), after taking the oath of office, delivered an address in which non-partisanship was urged. The new cabinet proposed by the Premier Tuan Chi-jui was composed of representatives of all political parties. On September 14th, Parliament confirmed the choice of ministers.

**TROUBLE WITH JAPAN.** Serious difficulties arose with Japan in consequence of an attack, August 15th, by Chinese troops on the Japanese garrison at Cheng-Chiatun, which is situated in a region subject to disputed claims since the signing of the Portsmouth Treaty. The troops killed or wounded 17 Japanese soldiers and one officer. The Japanese immediately sent a force of 2000 soldiers to the aid of the besieged garrison. According to the Chinese account of the affair the local authorities had ordered certain measures of safety to be taken against a threatened raid by bandits and carrying out these measures tried to arrest the Japanese. Armed resistance followed, resulting in the casualties above mentioned. The magistrate responsible for this act was, according to this report, captured and carried off by the Japanese. On September 3rd, the Japanese Minister to China, Baron Hayashi, prepared the following demands: First, dismissal of the Chinese officer in command; second, withdrawal of Chinese troops from the district; third, indemnity to the families of the Japanese slain; fourth, the right of Japan to police power in inner Mongolia. The last of these demands was regarded as very serious as it infringed upon Chinese sovereignty over Inner Mongolia. There were further demands made upon China that were not published. A later version of Japan's requirements indicated that the Japanese demanded also the punishment of the commanding officer, and the dismissal of others, and that Chinese troops should be ordered publicly not to interfere with the Japanese in Inner Mongolia, and South Manchuria; also special interests for Japanese in these territories including police and administrative power, advantages in the matter of loans, etc., were demanded. Upon the inquiry of the United States State Department, the American ambassador to Japan reported on September 12th, that the Japanese Foreign Office declared that there was nothing in the Japanese demands that infringed upon Chinese sovereignty or violated the Root-Takahira agreement. He said that the Japanese demands were limited to apologies, indemnification, and the appointment of Japanese military advisers in South Manchuria, and in the military school at Mukden; also that the Japanese should police localities where there was a large Japanese element.

**RAILWAY CONCESSIONS.** On March 29th, the Chinese government signed an agreement with the Russo-Asiatic bank for the construction of

a railway from Kharbin to Blagoveshchensk, which, covering a distance of 600 miles, will open up river basins and a fertile country. The concession provided for a loan of £5,000,000 to be floated after the war. See also above paragraph on *Communications*.

See *EXPLORATION*.

**CHLORAZENE.** A new antiseptic given as a proprietary name to Dakin's Solution (q.v.) which has been recently used with success in the treatment of infected wounds, where a non-irritating but powerful germicide is necessary. Chlorazene is a white, crystalline powder, having an odor of chlorine, and known chemically as Sodium Para-toluesesulphochloramine,  $\text{CH}_2\text{Cl}_2\text{H}_2\text{SO}_2\text{Na}$ ;  $\text{NCl} + 3\text{H}_2\text{O}$ . Like the hypochlorite, chlorazene does not precipitate proteins, such as blood serum, thus having the advantage over bichlorid of mercury and some other antiseptics in common use. It is said to be absolutely non-toxic, but should not be given internally, since it is precipitated by the gastric juice.

**CHORAL SOCIETIES.** See *MUSIC*.

**CHOSEN.** See *KOREA*.

**CHRISTIAN ENDEAVOR, UNITED SOCIETY OF.** Within the year 2000 new societies of Christian Endeavor have been added to the world organization, making a total of 77,000. There are 4,000,000 members, belonging to 80 denominations. Local conventions meet more often but the international convention is held biennially. The next such gathering, the 28th, will take place in New York City, July 4th-9th, 1917.

**CHRISTIANS.** This denomination according to recent progress had in 1916 about 114,500 communicants, 1400 churches, and 1100 ministers. The administrative body of the Church is the American Christian Convention, which is made up mostly of delegates from the conference. This exercises a general supervision over the work of the denomination. Several schools and colleges are maintained, the most important of which are the Union Christian College in Indiana, Defiance College in Ohio, Starkey Seminary in New York, Elon College and Franklinton Christian College (colored) in North Carolina, Palmer College and Weaubleau College in Missouri, and Jireh College in Wyoming. It has also a theological school, the Christian Biblical Institute, in Ohio. Missions are conducted in Japan, Porto Rico, continental United States, and Canada.

**CHRISTIAN SCIENCE.** The 21st annual business meeting of the Mother Church was held in Boston on June 5, 1916. The report of the clerk gave interesting facts of progress since the dedication of the Mother Church 10 years before. In 1906 there were 949 Christian Science organizations; in 1916 there were 1616, an increase of 70 per cent. During 1906-16 the membership of the Mother Church increased 116 per cent, and the Christian Science periodicals during that period had a much greater percentage of increase than either the branch organizations or the church membership. The net increase in Christian Science organizations in 1915-16 was 65, included among which are churches or societies in South Africa, England, British West Indies, and Panama. There were, in 1916, over 3000 unorganized groups of people throughout the world holding Christian Science services, some being in the most remote and inaccessible parts of distant lands. In 1916 2245 Christian

Science lectures were given, an increase of 716 over 1915. The attendance was about 1,560,000, an increase over that of 1915 of approximately 370,000, or 31 per cent. The total annual attendance at Christian Science lectures more than doubled since 1912. The report of the treasurer showed an excellent financial condition in 1916. Since the opening of the European war relief fund of the Mother Church there had been subscribed all told the sum of \$193,544.36, of which \$187,788.18 had been forwarded to the committees of Christian Scientists entrusted with its distribution. Money was sent to England, France, Germany, Switzerland, Holland, and other European countries.

The total receipts of the Mary Baker Eddy memorial fund up to May 31, 1916, were \$104,791.64, and it was estimated that the total cost of the memorial and the establishment of a fund for its perpetual maintenance will approximate \$150,000. In December, 1916, it was officially stated that the memorial had been nearly completed. The officers of the Mother Church for 1916-17 are: Calvin A. Frye, president; Adam H. Dickey, treasurer; John V. Dittmore, clerk. According to a statement by the trustees under the will of Mary Baker Eddy the trustees paid out, in 1915-16, \$6558.56 for lectures given outside of the United States and Canada. Because of the disturbed conditions of travel in the war zone no lecturer visited central Europe since the last annual meeting. The total amount paid in 1915-16 for Christian Science literature distributed free was \$173,683.35, about one-third of which was contributed by the trustees. A total of 757,643 pieces of literature was distributed in 1915-16 among countries engaged in the European war.

In October, 1916, a statement was issued by the Christian Science Board of Directors announcing that in pursuance of a plan first mentioned by Mrs. Eddy, about 1905, a new and important department of the organized work of Christian Science had been inaugurated under the name of the Christian Science Benevolent Association. Among its objects is that of caring for some of the early students of Mrs. Eddy and for others who helped lay the foundations of the Christian Science movement and who now need provision for their peace and comfort. A gift by Mrs. Longyear of 20 acres of land near Brookline, Mass., was accepted as a site for the first Christian Science home or sanatorium to be established and conducted by the Mother Church. Another statement by the directors in December, 1916, called upon Christian Scientists for a financial contribution of \$526,500 to pay for real estate acquired, and \$600,000 for the buildings, equipment, and maintenance of the first institution of the Christian Science Benevolent Association.

**CHURCHES.** See *ARCHITECTURE*.

**CHURCHES OF CHRIST IN AMERICA,** FEDERAL COUNCIL OF THE. See *FEDERAL COUNCIL*.

**CHURCHILL, WINSTON LEONARD SPENCER.** See *WAR OF THE NATIONS, Diplomacy*.

**CHURCH OF ENGLAND.** See *ENGLAND, CHURCH OF*.

**CHURCH OF GOD.** See *ADVENTISTS*.

**CHURCH OF GOD IN JESUS CHRIST.** See *ADVENTISTS*.

**CHURCH OF THE NEW JERUSALEM.** This denomination in 1916 had about 10,000 com-

municants, 151 churches, and 147 ministers. It rejects the commonly received notion of the Trinity, and acknowledges the Lord Jesus Christ as the One God. The true meaning of the Scriptures was revealed, according to the teaching of this denomination, in the writings of Emmanuel Swedenborg. The General Convention exercises a supervision over the Church. Its officers are: Rev. Julian K. Smyth, president; B. A. Whittemore, recording secretary; J. R. Carter, treasurer. The *New-Church Messenger* is the official journal. The publishing house is at 3 West 29th Street, New York City. It publishes Swedenborg's works.

**CHURCH STATISTICS.** See RELIGIOUS DENOMINATIONS.

**CIGARETTES.** See TOBACCO.

**CIGARS.** See TOBACCO

**CINCINNATI, UNIVERSITY OF.** A coeducational institution at Cincinnati, Ohio, founded in 1870. It is one of the few municipal universities in the United States. There were enrolled in the several departments 3038 students in the fall of 1916. The faculty numbered 159. During the year a new department of physical education was established. Francis Baldwin gave the institution \$600,000. At the end of 1916 the productive funds amounted to \$880,000, yielding an income of \$68,055. By taxation, the city added to this \$219,664. The library has 75,000 volumes. Since a year ago a new chemical building and a woman's building have been completed. President, Charles William Dabney.

**CINCINNATI MAY FESTIVAL.** See

MUSIC, *Festivals.*

**CINCINNATI SYMPHONY ORCHESTRA.** See MUSIC, *Novelties.*

**CITRUS FRUITS.** See HORTICULTURE.

**CITY GOVERNMENT.** See MUNICIPAL GOVERNMENT.

**CITY-MANAGER PLAN.** See MUNICIPAL GOVERNMENT.

**CITY PLANNING.** Substantial progress in city planning was made in various directions and in all parts of the country during the year. There was relatively little new State legislation on the subject, it being an "off year" for the legislatures. New York City and Sacramento enacted notable zoning regulations, and the merchants of New York did some very effective zoning work of their own in their "Saving New York" movement. A comprehensive city plan was submitted to the city authorities of Newark, N. J. The civic centres of Cleveland and San Francisco were carried forward by the completion of city halls. Various organizations contributed to the study of city planning and to the creation of sound public opinion on the subject. The good advisory work of the Conservation Commission of Canada was continued. Europe was not able to give much attention to city planning, but will doubtless attack the subject with renewed zeal when the war is over. A Dublin competition, announced before the war, was brought to a conclusion.

**NEW YORK ZONING REGULATIONS.** The use to which buildings may be put, their height in relation to street widths, and their size as regards the percentage of the area of lots that may be covered are all to be governed in New York City by regulations adopted on July 25, 1916, by a 15 to 1 vote of the Board of Estimate and Apportionment—which is the real governing body of New York City. The regulations went into

effect immediately, in all five boroughs of the city, but they apply to new buildings only. They were framed by a Commission on Building Districts and Restrictions, appointed by the Board of Estimate in 1914, in accordance with a legislative act or charter amendment passed in that year. This act, in turn, was recommended by a Heights of Buildings Commission, appointed early in 1913. The earlier commission made a notable report of 295 pages in 1914, covering the whole subject of the height, area, and use of buildings. It recommended that for the purposes of building regulations the city be divided into districts and that regulations for each district be framed in accordance with local conditions. The later commission, composed of 16 members, headed by Edward M. Bassett, chairman, caused a detailed study of the whole city to be made, block by block. Before the regulations were finally adopted by the commission, public hearings were held on the regulations as applied to various geographical sections of the city. There were practically no objections to the general principles on which the regulations are based, a fact that in itself is remarkable testimony to the growth of public sentiment in favor of substituting an orderly plan to the haphazard growth that has hitherto characterized New York and practically all other American cities. Use regulations, under the New York Plan, classify the 327 square miles of the city into residential, business, and unrestricted areas. The classification has been made street by street and block by block, and sectional maps have been prepared showing by symbols just what the use restrictions for each block are. About two-fifths of Manhattan borough and two-thirds of the whole city is made up of residence districts from which business and industry are excluded so far as new establishments are concerned. In the business districts the restrictions are against all manufacturing (except some unobjectionable types), public stables and garages, but not against residences. All the central part of Manhattan, east and west, above 23rd Street, is to be a business district hereafter. Existing factories are not disturbed, but some of these are being moved by the action of the merchants of the district, under the "Saving New York" movement outlined below. On the shores of Jamaica Bay and Staten Island some undetermined areas have been left pending future plans for port development. *Height* of buildings will be governed chiefly by the width of the streets on which they front but there will be variations for different parts of the city. Broadly, the relation between height and width will be 2½ times in the financial district, twice in central Manhattan, 1½ times in the rest of Manhattan and in some small areas, down to heights equal to street widths elsewhere. These figures, however, are materially qualified since a tower occupying not more than a fourth of the area of the lot may be carried to any desired height, while by the use of setbacks the height limitations may also be exceeded for a part of a building. *Size* limits, or the percentage of the lot area that may be covered by the building, vary from 100 per cent in warehouse districts down through three other grades for various uses until in villa residential sections a house may cover only 30 per cent of the lot and must be well separated from other houses on at least one side. Furthermore, the higher the build-

ings, the more of the lot must be left unoccupied. Concessions are allowed where recreational facilities are provided. The report of the commission, made in June, 1916, contains an abundance of diagrams to make clear the various regulations. The administration of the new districting or zoning regulations is in the hands of the city superintendents of buildings for each of the five boroughs and, as regards tenements, in the tenement-house commissioner for the whole city. The city fire commissioner has jurisdiction over completed buildings. Appeals from the ruling of these officials may be made to a Board of Appeals. The Board of Estimate can amend the regulations on its own initiative at any time, after notice and hearings, provided 20 per cent of the property owners to be affected do not object; while if 50 per cent of the property owners on any street or in any district petition for a change in the map as regards their street or district the Board of Estimate must act on the petition within 30 days. Finally, since there is a tendency to follow the lead of New York, it has been urged that regulations framed for the very complex and unusual conditions pertaining in New York City should not be adopted elsewhere to determine whether they suit local conditions.

**SAVING NEW YORK.** A remarkable demonstration of the need for a zoning system in New York was presented just as the commission whose work has been outlined was drawing its labors to a close. It was made by the large retail merchants of New York, who banded together and in full-page advertisements in the daily press of New York not only plead for the exclusion of wholesale clothing manufactories from the district bounded by 33rd and 59th streets on the north and south and Third and Seventh avenues east and west, but also declared that after Feb. 1, 1917, they would give preference to buying from manufacturers located outside the area named. This plea and demand were caused by the recent invasion of the district by clothing manufactories who located close by the large stores, even on Fifth Avenue. The thousands of workers in these shops so crowded the streets at the lunch hour as to make getting in or out of the stores almost impossible. If the stores moved, there was no assurance that they would not be followed by the clothing shops. Indications at the close of the year were that the campaign would be successful and that by this action, combined with the new use and height regulations of 1916, New York will be saved an extension to the northward of the blighted district farther downtown, in which real-estate values have been heavily depreciated by the uncontrolled migration of business and unregulated construction of skyscrapers.

**ZONING AND OTHER CITY PLANNING IN SACRAMENTO.** The zoning system can be applied to a small as well as to a large city, as is shown by the action of Sacramento, Cal., the authorities of which divided the city into three use districts in 1916 and gave attention to various other city-plan reforms as well. Like many other American cities, Sacramento has a surplusage of street area. In the older part of the city more than half of the total area is given up to streets "whereas 30 per cent would be a liberal allowance for a city of the character of Sacramento," says John Nolan in a city-planning report. This 20 per cent (600 acres) of need-

less and ill-planned street area, Mr. Nolan urges, might better have been devoted to a few wide streets where needed for heavy traffic, to plazas, to a liberal civic centre, and to a couple of blocks of land for each public school. Moreover, a reduction in street width would cut down "the cost of street upkeep many thousand dollars a year," while a properly designed street circulating system would "save time in transit for both people and goods and increase the income of the city from local taxes, because more property could be used productively." The evil effects of excessive street widths are not confined to the older part of the city. In newer sections bungalows elbow each other on either side and have their fronts close to the sidewalks because so much land has been taken for streets as to make crowding upon the scanty remaining lot area a seeming necessity.

The zoning system adopted by Sacramento provides for industrial, business, and residential districts. The industrial zone is near the water front and either has or can easily be given railway service. As yet this district has few industries, giving a free hand for adopting street widths and pavements to local needs. The business zone is already devoted to business, but can be improved for that purpose. A part of the residence zone joins the industrial district, thus affording accommodation to those who wish to live close by their daily work. Mr. Nolan has worked out schemes for the arrangement of lots and buildings in first-class, second-class, and bungalow districts, and for neighborhood centres, the latter to include apartments, stores, a school, a church, a theatre, and a fine station grouped around a small park. Last but not least, the Sacramento replanning scheme provides for some new main thoroughfares superimposed on the old gridiron street plan.

**A COMPREHENSIVE PLAN FOR NEWARK.** After three and a half years of study, aided by a permanent secretary and outside specialists, the City Plan Commission of Newark, N. J., submitted a "Comprehensive Plan of Newark" during the year in the form of a report accompanied by numerous maps, diagrams, and halftones. The "Plan" embraces important street improvements to relieve congestion of traffic in the business district and to perfect the chief arteries of travel, as well as extensions and improvements of minor streets and a street plan for the new meadow and port district; transportation changes and additions, including trolley and vehicular service, harbor and railway facilities; new parks and parkways; the better control of housing and of the development of private property, together with districting or zoning; and also "metropolitan planning," or the correlation of the city and its suburbs. Lest so comprehensive a scheme should break down by its own weight, it is carefully distributed by five-year periods over the next forty years. The realization of the "Plan" depends upon action by the city council, to whom the report is addressed. Meanwhile the commission and its studies continue.

**THE SAN FRANCISCO CIVIC CENTRE** is rapidly taking shape. The new city hall, completed during the year, has a ground area of 278 x 415 feet. It is a four-story building, with a central dome 112 feet in diameter and over 300 feet high. The exterior walls and columns are of granite. The building fronts on one of the

larger sides of a plaza 413 x 619 feet in area, that will be decorated with fountains and statuary and planted with trees. A civic auditorium, donated to the city by the Panama-Pacific Exposition, faces one of the shorter sides or ends of the plaza. Across the length of the plaza from the auditorium a State building was under construction in 1916. Facing the city hall across the plaza a public library was being put up, and alongside it, occupying the other corner of the block, a civic opera house is to be erected. A public-health building, a fire-and-police building, and two other public buildings will complete the quadrangular group. Each of these four last-named buildings is diagonally opposite a corner of the plaza and is a small structure compared with the five major buildings in the group, of which five the city hall is of course dominant.

**CLEVELAND.** The third building to be completed in the "Group Plan or Civic Centre" for Cleveland, Ohio, was the city hall, which was dedicated on July 4th. It is a five-story building, covering an area of 230 x 380 feet, with an exterior facing of Vermont gray granite, and much Italian marble for the interior finish. It cost about \$3,000,000. The other two buildings of the group already completed are a Federal building and a county court house. The library in the group plan will be built on the site of the old city hall which is now being wrecked. At the election over a year ago \$2,000,000 bonds were voted to build the building. Considerable time was used up in a friendly suit to settle title, but there should be no further delay. A board having the supervision of construction has been appointed and the architects, Walker and Weeks, have been selected. The group will be completed by the addition of a convention hall, for which bonds were voted in April, 1916, and a union station, already agreed upon by the city and railways, and authorized by popular vote. The six buildings in the group will cost about \$30,000,000 and will follow a general plan worked out a number of years ago by a committee of experts.

**ARTERIAL HIGHWAYS FOR DULUTH.** All over the country civic bodies and commercial organizations having civic committees continue to show their interest in city planning by tackling some local problem—from remodeling the whole city plan to remedying a single outstanding defect. As an example of a middle-ground effort mention may be made of a scheme for arterial highways and for civic centres worked out for the city planning committee of the Commercial Club of Duluth, Minn., by W. B. Patton, formerly city engineer. Duluth suffers from a gridiron or checker-board street plan, ill adapted to a city rising abruptly from the water. The streets running back from the water have heavy grades and as a result considerable areas are unoccupied because access to them is so difficult. The early plan of the city provided for two diagonal thoroughfares, but the one of these that was constructed and used is poorly located and has grades up to 12½ per cent. Several diagonal highways leading up the hill from the water front on relatively easy grades were proposed in Mr. Patton's plan; also a civic centre and a secondary civic centre, each near the lake.

**PROGRESS IN MASSACHUSETTS.** Several years ago, Massachusetts provided for planning boards in all cities and also in all towns of 10,000 pop-

ulation or more, but these boards had little power beyond that of investigation and advice. The 1916 Legislature passed an act (Chap. 190) authorizing the mayor of any city, with the approval of the city legislative body, to appoint a board of survey of three members that would have some real and additional possible control over city planning. The city engineer acts as clerk of any such board. Once such a board is created, no plan or profile of any street can be legally adopted without submission to, hearing upon, and approval by, the board of survey. Possible broader city planning powers are conferred by a section of the new act that says the board of survey of its own initiative may, or when directed by the local planning board and city council must, make a comprehensive plan for any chosen section of the city. Provision is made for hearings on such proposed plans, after which they become official, if so voted by the board of surveys. The city engineer is clerk of the board of surveys and prepares for the board such plans as have just been mentioned.

As an example of the many ways in which city-planning ideas are being spread it may be noted that the Indiana Real Estate Association (Scott R. Brewer, secretary, Indianapolis) conducted a city-planning campaign from October 9th to 16th. Cities having real-estate boards, and other places as well, were visited by officers of the association and addresses on city planning were made by authorities on the subject in accordance with a carefully prepared programme.

**ORGANIZATION WORK.** The National Conference on City Planning held its eighth annual meeting at Cleveland, Ohio, in June. In July the Pennsylvania State Association of City Planning Officials was organized. In November, the Massachusetts Federation of City Planning Boards held its third conference.

**CANADA AND GREAT BRITAIN.** That intelligent city planning rests on an engineering foundation, was emphasized in an article on "Town Planning in Canada," by Thomas Adams, town planning adviser to the Canadian Commission on Conservation, in a recent article (*Engineering News*, May 25, 1916). In Great Britain, nearly all the 152 planning schemes being worked out were in the hands of municipal engineers. The schemes were mostly in their earlier stages and for their full realization will require the coöperation of landscape and building architects. In Canada, Mr. Adams wrote, town planning (the term used in Great Britain and her colonies) "is being placed in the hands of engineers and architects acting in collaboration." With these, public-health experts are also working. "Housing and town planning are dealt with as twin problems." The amenities of life are also given a prominent place. Four of the nine Canadian provinces had planning acts when Mr. Adams wrote. The Conservation Commission serves in an advisory capacity to all the provinces, cities, and towns of the Dominion.

The prize of \$2500 in the Dublin Town Plan Competition, instituted by the Earl of Aberdeen in 1914, while Lord Lieutenant of Ireland, was announced early in 1916 as awarded to Prof. Patrick Abercrombie of Liverpool jointly with Sydney A. Kelley and Arthur J. Kelley. Those securing honorable mention included F. A. C. Smith, Assistant Director Civic Extension Service, Massachusetts Agricultural College. The

judges were Prof. Patrick Geddes, Edinburgh, Charles McCarthy, Dublin, and John Nolan, Cambridge, Mass. An American loan of \$2,000,000 has been obtained by Dublin for city improvements, especially in housing conditions.

See BUILDING OPERATIONS.

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**CIVIC ASSOCIATION, AMERICAN.** The 12th annual meeting of the Association, held in Washington the second week of December, marked a year of progress in activities relating to the physical improvement of cities, towns, and rural districts, and to the preservation of natural scenery, such as Niagara Falls and the National Parks. The reports at the convention indicated that in many sections of the country definite work for the planning of cities along orderly lines and for the extension of rural development has been stimulated rather than hindered by European war conditions. An important achievement of the year was the passage by Congress of a bill to create a National Park Service in the Department of the Interior, bringing under one management all national parks and monuments. The proposal for such a service originated with the Civic Association six years ago. Officers: J. Horace McFarland, president; William B. Howland, treasurer; and Richard B. Watrous, secretary. General headquarters are in Washington.

**CIVIC CENTRES.** See CITY PLANNING.

**CIVIC ORCHESTRA.** See MUSIC, *Orchestras*.

**CIVIL SERVICE.** The total number of persons in the civil service of the United States on June 30, 1915, was 476,363. This includes 20,674 employed in the Isthmian Canal service, and are unclassified. The total number in the classified civil service was 455,689. Of these, 34,430 were employed in the departments of Washington, and 421,259 outside Washington. Of those employed in Washington, 8244 were in the Treasury Department, 5021 in the Post Office Department, 4480 in the Department of Agriculture. Of those outside Washington the greater number were fourth class post-masters, 182,167. Of the total number in the civil service, 9730 were appointed by the President. The others held their positions under civil service rules. There were 263,177 competitive positions, 124,039 excepted and uncompetitive positions, and 24,313 unclassified positions.

**LEGISLATURE.** No measures directly affecting the civil service were passed by Congress in 1916, and there was less discussion than usual as to the administration of civil service. Several States passed measures affecting civil service. New York authorized Civil War veterans employed continuously for 10 years in the State service who have reached 70 years of age, to apply for retirement at half pay, not exceeding \$1000. New Jersey required the State commission to provide for the keeping of efficiency rec-

ords for the State and municipal competitive service. Municipalities are required to keep efficiency records subject to the supervision of the State commission. These records are to be used as a basis for promotion, and in the case of reduction of force the persons shown by the records to be the least efficient are to be dropped first. It provides also for demotion to lesser positions of persons whose positions are abolished for reasons of economy, and for placing such persons' names on the special eligible lists, which take precedence of other lists for the positions abolished or similar positions. The New Jersey Legislature also created a commission to study the operations of the civil service laws in the State, and in its municipalities. New York gave municipal commissions the power to investigate the operation of the civil service law and rules, conduct hearings, summon witnesses, etc. The Legislature of Massachusetts authorized the commission to investigate the work and compensation of officers and employees in the classified service, and on request of the appointing power, to inquire into the efficiency and conduct of the particular officers and employees, and if necessary recommend their removal. See CIVIL SERVICE REFORM LEAGUE; UNITED STATES.

**CIVIL SERVICE COMMISSIONS.** See CIVIL SERVICE.

**CIVIL SERVICE REFORM LEAGUE, NATIONAL.** The League held its 36th annual meeting at New Haven, Conn., December 5th. At this meeting the council of the League reported on the work of the year. It was announced that the League would endeavor to have the Tenure of Office acts of 1820 repealed, in order to prepare the way for a reform in the competitive classification of presidential post-masters. It was predicted that a reform would result in saving \$10,000,000 annually. Note was made of the fact that, as never before in the history of the merit system, the two leading presidential candidates in 1916 declared themselves in favor of a programme involving an attack on senatorial spoils. A large share of the League's activity during 1916 related to an attempt to examine the records of the Federal Civil Service Commission. A lengthy correspondence, part of it with the President, was made public on August 9th. It was reported that Postmaster-General Burleson had declared publicly that "60 per cent of the incumbent fourth class postmasters were not disturbed" by the Wilson administration. The League claimed that whatever the situation might be, publicity should not be denied to the records of the Civil Service Commission. The League objected, in 1916, to provisions in the Rural Credits bill, the National Defense legislation, and the Shipping and Immigration bills, on the ground that they violated the merit principle. As passed, only one, the Rural Credits bill, contains the criticised items. The officers of the League are: President, Richard Henry Dana; secretary, George E. Keyes; treasurer, A. S. Frissell.

**CLANRICARDE, HUBERT GEORGE DE BURGHE CANNING, second Marquis.** A British landlord, died April 12, 1916, in London. He was born in 1832, second son of the first marquis. After an education at Harrow, he was stationed in the diplomatic service at Turin for a decade, and from 1867 to 1871 sat in Parliament as Liberal member for County Galway. Three years later

he succeeded his father, his elder brother having died unmarried. He was known in London as an art collector, but throughout Great Britain and abroad was famous chiefly as one of the Irish absentee landlords who opposed the Land Acts most tenaciously and were most cordially hated by their tenants. Lord Clanricarde protested that his rents were not high and could show estates well managed, but he never yielded when it was a question of his legal rights. From the time that he came into possession of his land until the purchase of the Clanricarde estates by the Congested Districts Board in July, 1915, he was engaged, almost without a break, in legal efforts to resist the whole policy of expropriation; the attempt at compulsory purchase he fought up to the highest courts. Finally the Land Court fixed a price for the purchase, £238,211.

**CLARKE, JAMES P.** An American legislator, died in Little Rock, Ark., Oct. 1, 1916. He was born in 1854 at Yazoo City, Miss., and studied law at the University of Virginia, graduating in 1878. Since then he had practiced law in Arkansas, first in Helena, till 1897, and thereafter in Little Rock. He early served in the Lower House of the State Legislature, and then in the State Senate, of which he was elected president in 1891; was Attorney General (1893-94) and Governor (1895-97); and at the end of his first term became a candidate for the United States Senate. Defeated in the primaries by James K. Jones, he began marshaling his forces, gained influence as a member of the Democratic National Committee, and in 1902 fought and won a bitter contest for the nomination that meant election. During his two full terms in the Senate, and the third, on which he had entered, he was known for striking independence of his own party. Recently he had opposed the Ship Purchase bill, bringing success to the Republican filibuster; had proposed the amendment to the Philippines bill, which, if it had been carried by the House, would have given the Philippines independence in four years; and had been one of two Democratic Senators who refused to sign the Eight-Hour Railroad bill of 1916. For several years, Senator Clarke was chairman of the Committee on Commerce, and he was the ranking Democratic member of the Foreign Relations Committee and Committee on Military Affairs.

**CLARKE, JOHN HESSIN.** An American jurist, whose nomination as associate justice of the Supreme Court of the United States, made by President Wilson, was confirmed by the Senate July 24, 1916. Born at Lisbon, Ohio, in 1857, he graduated from Western Reserve University in 1877, the next year was admitted to the bar, and practiced thereafter in various parts of Ohio, after 1897 in Cleveland. In this city he became a supporter of Tom Johnson and of his reform measures, including the three-cent trolley fare. For many years Mr. Clarke was general counsel for the Nickel Plate Railroad. In 1903, as Democratic candidate for the United States Senate, he opposed Mark Hanna. By President Wilson he was appointed in 1914 United States District Judge of the Northern District of Ohio. Judge Clarke identified himself prominently with the anti-imperialist and short ballot movements in Ohio, and in 1913 served as president of the Perry's Victory Centennial Commission of Ohio. He is one of the

few unmarried men ever appointed to the Supreme Court bench.

**CLARK UNIVERSITY.** A non-sectarian institution for graduate study at Worcester, Mass. It was founded in 1889. There were 101 students in the autumn of 1916 and 23 faculty members. The university library and art department have an endowment of \$2,400,000, from which they draw an income of \$103,875. The library contains 65,000 volumes. President, G. Stanley Hall.

**CLASSICAL LITERATURE AND SCHOLARSHIP.** See PHILOLOGY, CLASSICAL.

**CLAY-WORKING INDUSTRIES.** The year 1915 was not one of general prosperity in these industries. The total value of all clay products marketed was \$163,120,232, compared with \$164,986,983 in 1914, a decrease of about 1 per cent. This decrease, however, was only about one-tenth as great as that of 1914, compared with 1913. During the latter part of 1915 business was very much better than in the early months. Of the two great divisions of the industry, brick and tile, and pottery, the former showed a decrease, and the latter showed an increase in value. The decrease in value of brick and tile was \$3,793,978, or nearly 3 per cent. The increase of pottery was \$1,927,227, or more than 5 per cent. In the brick and tile industry an increase was shown in the vitrified front and fire brick, marketed, and a decrease in the quantity of common brick marketed in 1915. In the pottery industry every variety of ware classified, except china, increased in value, and the decrease in china was only about 2 per cent. Every State in the Union is a producer of clay products. Ohio ranks first, followed by Pennsylvania, New Jersey, and Illinois.

**CLEARINGS, BANK.** See FINANCIAL REVIEW.

**CLEARING SYSTEM.** See BANKS AND BANKING, *Federal Reserve System*.

**CLEMENTI-SMITH, SIR CECIL.** A British colonial governor, died Feb. 6, 1916, at Welwyn, Hertfordshire. He was born in London in 1840, and attended Corpus Christi College, Cambridge, which made him an honorary fellow in 1912. He was early a student interpreter at Hong-kong, and later Colonial Treasurer there; subsequently he served as Colonial Secretary of the Straits Settlements, as Lieutenant Governor of Ceylon, as Governor of the Straits Settlements, where he did much to put down the secret Chinese societies, and as High Commissioner and Consul General for Borneo and Sarawak, retiring in 1893. He received the K.C.M.G., later the G.C.M.G., and was made a Privy Councillor in 1906. Clementi-Smith was active in the movement to abolish the opium traffic.

**CLÉOPÂTRE.** See MUSIC, *Opera*.

**CLEVELAND.** See CITY PLANNING; PAINTING AND SCULPTURE.

**CLIFFORD, SIR HUGH.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, English.

**CLIMATE.** See METEOROLOGY.

**CLIMATE, GEOLOGICAL.** See GEOLOGY, *Geological Climate*.

**CLOTHING INDUSTRY.** See STRIKES.

**CLUBS.** See ARCHITECTURE.

**COAL.** The production and consumption of coal in 1916 exceeded all previous records. The amount of bituminous coal mined during the year is estimated by the United States Geological Survey at slightly more than 509,000,000 net



tons, an increase of more than 66,500,000 tons over the production of 1915. The production of Pennsylvania anthracite was 88,312,000 net tons, or about 600,000 tons less than in 1915. The total production of coal in the United States in 1916 was 597,500,000 net tons, compared with 570,000,000 tons in 1913.

The increase in production was general, only three States, Maryland, Oklahoma, and Texas, having a smaller production than in 1915. The largest increase was in Ohio, whose production in 1916 was estimated at 37,000,000 tons, compared with 22,435,000 tons in 1915, a gain of 65 per cent. Colorado, New Mexico, Virginia, and Washington showed increases of more than 20 per cent, and Kentucky, Montana, North Dakota, Tennessee, and Wyoming of 14 to 18 per cent. In Pennsylvania the increase was about 17,000,000 tons, or 11 per cent.

Consumption of coal by the railroads is estimated to have been 17,500,000 tons greater than in 1915. The use of coal in the manufacture of coke was greater by 20,500,000 tons, approximately increasing 7,000,000 tons. The coal mines used 5,000,000 more tons for steam and heat, and the increased consumption chiefly by manufacturing industry was 21,000,000 tons. Exports were increased by about 2,500,000 net tons. This increased consumption brought about a condition in which the demand for coal was greater than the ability of the railroads to deliver it, and in some localities the mines failed to produce because of the scarcity of labor.

The economic position of coal in 1916, not only in the United States but throughout the world, presented many elements of interest. The excess of demand over supply, the shortage of transportation, and the increase in prices all were related and figured prominently. Most of the bituminous coal in the United States was sold during the year on contract at prices made early in the months that represented merely the increased wages, but these prices during the latter part of the year did not hold for those who had not contracts and were forced to go into the open market. In addition to lack of cars speculation was believed to have figured in the high prices that ensued, but it was argued that the prices of coal were not greater proportionately than those of other necessities whose values had appreciated during the year. At the same time coal was in demand and for export whenever suitable bottoms could be furnished. In many places in the United States the shortage of coal was so pronounced as almost to suggest or threaten a coal famine, and there were instances of coal being purchased and distributed at cost by manufacturers. The congestion of freight on the railroads and at terminals and the inability of mine operators to secure cars also contributed to shortages at various points which forced retailers to pay high prices. These in turn were imposed on their customers, and were a cause of complaint and official investigations.

The shipments of bituminous coal from October, 1915, to March, 1916, were probably greater than in any other like period in the history of the American industry. The maximum monthly total for this period and for both years was reached in January, 1916, and was in excess of 40,000,000 tons. The production in this winter period from October, 1915, to March, 1916, was even higher than the normal output required for

heating and industrial purposes in the winter months as well as on the railways, owing to the fact that large consumers, the railroads in particular, were putting coal into storage in anticipation of a possible shutting down of many of the mines in April and the months following, while a new wage scale was being negotiated. It was estimated that not less than 10,000,000 tons were put into storage. An increase in shipments in August of nearly 14 per cent over July was attributed to the purchase of coal for storage in anticipation of a general railroad strike on September 1st. The demand for coal increased in the last weeks of September and reached a maximum early in November, when prices of free coal were several times those in the earlier part of the year. In October production and shipments were below requirements, and in November and December there were decreases, from October, although even under ordinary conditions increases should have been shown.

The factor most seriously affecting the production and shipment of bituminous coal in the last half of the year was the lack of transportation facilities. Serious trouble from lack of cars was experienced as early as July and was almost universal by the first of October. The production and shipments of bituminous coal in November were about 80 to 85 per cent of the estimated requirements, and the inability of the railroads to transport this additional 5,000,000 to 8,000,000 tons needed by the country caused an actual shortage of fuel at the points of consumption, the result of which was an unprecedented rise in prices for spot coal and a panic among buyers.

So pronounced was the shortage of labor during the year that it was considered an open question whether the mines could have produced all the coal demanded in the last quarter of 1916. Even at the end of 1915 a serious shortage of labor was impending, and in 1916 in many districts this scarcity of labor, notably in the last half of the year, was such as to have restricted production even had the supply of cars been greater. Many workmen sought work in other coal fields in the hope of securing better working time, or going into other industries, such as metal mining in the West and factories and munition works in the East. It was believed that the number of men employed in the production of bituminous coal in 1916 was slightly greater than in 1915 (557,456), and that the average number of days worked was more than 230, compared with 203 in 1915 and 232 in 1913, so that the scarcity of labor was due to a greater increase in the demand rather than in the supply of labor. For labor conditions in Colorado coal fields, see **ARBITRATION AND CONCILIATION, INDUSTRIAL**.

In the Eastern markets a high level of prices for Pennsylvania and Maryland coals in January and February was followed by a recession; but in September there began a buying movement that by the first half of November forced the prices for free coal up to three to five times the summer quotations and more than twice those of the previous January and February. These record-breaking prices prevailed for two or three weeks and were followed by a comparatively slight recession to a level that was maintained to the end of the year. In the Western markets sudden fluctuations in the prices for

free coal in the Chicago market, early in September, were followed in October by a rapid rise that carried prices by the end of November to the high point for the year. The highest point was less than three times the summer level, and the rise was not as great as in the East.

The estimated production of anthracite in 1916 showed a slight decrease compared with the preceding year, but the total quantity sold and delivered to consumers exceeded that of 1915 by more than 10 per cent. The year 1916 opened with an unusual quantity of coal in storage—variously estimated at 8,000,000 to 8,000,000 tons. The first three months of 1916 showed an increase in production over the corresponding period of 1915, but, in April, however, on account of considerable idleness among the miners while the wage agreement was in process of adjustment, there was a decreased output over the same month of 1915. In May, June, July, and August the production was slightly more (about 250,000 tons) than in 1915. During this period in 1916, however, demand for anthracite had been unexpectedly stimulated both by manufacturing industries (owing to a shortage of bituminous coal) and by domestic consumers who, warned by the experience of the winter of 1915-16, had indicated an intention to lay in their fuel for the cold season in advance and at the same time take advantage of the summer discounts. There was a serious shortage of miners and miners' helpers, and other labor in the anthracite region, many operators finding their forces depleted by as much as 25 per cent before the end of the year. Production fell off materially in the last few months of the year, the output for that period being about 2,000,000 tons less than for the corresponding months in 1915.

Coal in Europe in 1916 was a leading consideration in view of the change in economic and industrial conditions brought about by the war. In Great Britain the total amount mined in the first six months of the year was 128,135,000 tons, an increase of 515,000 tons over the corresponding period of 1915, but a decrease of 11,850,000 when compared with the half year of 1914 before the war, notwithstanding every effort was made to secure maximum output. There was more constant working of the pits than ever before and the number of persons employed at the end of the first quarter of the year was but 0.4 per cent less than in 1915, and 14.3 per cent less than in 1914. According to the statements of Mr. Asquith, the nation and the Allies were bound to experience serious results from absenteeism among colliery workers who in many cases were exempt from military service, and it was proposed in some cases to withdraw these exemptions from men refraining from work. In South Yorkshire and Warwickshire new coal developments were in progress and also in South Staffordshire. In November demands for increased wages involving threats of strikes, were made by miners in Scotland and Wales, and as a result in South Wales the government assumed control of all the mines and granted a wage increase of 15 per cent. This of course presented a new situation in Great Britain and its outcome was awaited with interest.

In Germany in 1916 the mining of coal was attended with increased costs and the govern-

ment and the producers were in controversy over the efforts of the latter to raise their quotations. While the government was said to have no strictly legal right to control the price of coal, save for the veto of the Prussian Crown over the Rhenish-Westphalian Coal Syndicate, yet during the war all advances in prices were submitted to the Prussian ministry of commerce. Accordingly at the end of the year increased prices were sanctioned for the Rhenish-Westphalian Coal Syndicate and for the Upper Silesian Coal Convention, to take effect in 1917. These advances made a total since the beginning of the war of five marks for the first named syndicate and four marks for the Upper Silesian Coal Convention. As in other countries cost of production had increased so rapidly that the operators were able to convince the government of the necessity for higher rates. See STRIKES.

**COAL, ARTIFICIAL.** See CHEMISTRY, INDUSTRIAL.

**COAST AND GEODETIC SURVEY, UNITED STATES.** The 100th anniversary of the founding of the United States Coast and Geodetic Survey was celebrated at Washington on April 5 and 6, 1916. There were three public sessions devoted to appropriate historical, technical, and other addresses, a banquet at which addresses were made by President Wilson, the Minister of Switzerland, Secretary of the Navy Daniels, Secretary of Commerce Redfield, and Dr. T. C. Mendenhall, a former Superintendent of the Survey, and a large exhibit of instruments, apparatus, and charts was held in the New National Museum. The Coast Survey was founded in 1816 with F. R. Hassler, a Swiss, as its first Superintendent, and not only organized the surveying of the coasts but also founded the national work in weights and measures. The Superintendent in 1916 was E. Lester Jones. The record of the celebration was published under the title *Centennial Celebration of the United States Coast and Geodetic Survey*, and contains all the addresses, many of which possessed considerable value as monographs on the fields covered.

**COAST DEFENSES.** See MILITARY PROGRESS, *United States*.

**COCHIN-CHINA.** A French colony, the southernmost division of French Indo-China (q.v.). Saigon is the capital, with about 68,000 inhabitants in 1911 (a 1915 estimate is about 100,000); Cholon has about 182,000.

**COINAGE.** See COINS, VALUE OF.

**COINS, VALUE OF.** The table on the following page gives the value of foreign coins in money of the United States.

**COKE.** There were produced in the United States in 1915 41,581,150 net tons of coke, valued at \$105,503,868, an increase, compared with the production in 1914, of 7,025,236 tons, or 20 per cent in quantity, and of \$17,169,651, or 19 per cent in value. By-products of coke showed the largest gain. The total quantity of 14,072,895 tons in 1915, being an increase of 2,852,952 long tons, or 25 per cent, over 1914. The increase in the output was general, except in a part of the South. Of those States whose record can be taken separately, all but six had greater outputs in 1915 than in 1914. The decrease was small, except in Virginia, where the decline amounted to 151,000 tons, or 19 per cent. Other States in which there was a decrease were Alabama, Georgia, and Tennessee in the Southern Ap-

Country	Standard	Monetary Unit	Value in U. S. Gold Dollar	Remarks. (a)
Argentina	Gold	Peso	\$0.9648	Currency: depreciated paper, convertible at 44 per cent of face value. Exchange rate about \$0.42½.
Austria-Hungary	Gold	Crown	.2026	
Belgium	Gold (b)	Franc	.1930	Member of Latin Union; gold is the actual standard.
Bolivia	Gold	Boliviano	.3893	12½ bolivianos equal 1 pound sterling.
Brazil	Gold	Milreis	.5462	Currency: government paper. Exchange rate about \$0.25 to the milreis.
British Colonies in Australia and Africa	Gold	Pound sterling	4.8665	
Canada	Gold	Dollar	1.0000	
Central American States:				
B. Honduras	Gold	Dollar	1.0000	
Costa Rica	Gold	Colon	.4653	Currency: inconvertible paper, exchange rate 40 pesos = \$1.00.
Guatemala	Silver	Peso	.4969	Currency: bank notes. Exchange rate about \$0.35.
Honduras	Silver	Peso	.3537	
Nicaragua	Gold	Cordoba	1.0000	Currency: convertible into silver on demand. Exchange rate about \$0.42.
Salvador	Silver	Peso	.3537	Currency: inconvertible paper; exchange rate approximately, \$0.14.
Chile	Gold	Peso	.3650	
China	Silver	Tael	{ Shanghai .7441 Haikwan .8289 Canton .8122	
Colombia	Gold	Dollar	1.0000	Currency: inconvertible paper; exchange rate, approximately, \$105 paper to \$1 gold.
Cuba	Gold	Peso	1.0000	
Denmark	Gold	Crown	.2680	
Ecuador	Gold	Sucre	.4867	
Egypt	Gold	Pound (100 piasters)	4.9431	The actual standard is the British pound sterling, which is legal tender for 97½ piasters.
Finland	Gold	Mark	.1930	
France	Gold (b)	Franc	.1930	Member of Latin Union; gold is the actual standard.
Germany	Gold	Mark	.2382	
Great Britain	Gold	Pound sterling	4.8665	
Greece	Gold (b)	Drachma	.1930	Member of Latin Union; gold is the actual standard.
Haiti	Gold	Gourde	.9647	Currency: inconvertible paper; exchange rate, approximately, \$0.16.
India (British)	Gold	Rupee	.3244	(15 rupees equal 1 pound sterling.)
Italy	Gold (b)	Lira	.1930	Member of Latin Union; gold is the actual standard.
Japan	Gold	Yen	.4985	
Liberia	Gold	Dollar	1.0000	Currency: depreciated silver token coins; customs duties are collected in gold.
Mexico	Gold	Peso	.4985	Mexican exchange rate fluctuating violently.
Netherlands	Gold	Florin	.4020	
Newfoundland	Gold	Dollar	1.0139	
Norway	Gold	Crown	.2680	
Panama	Gold	Balboa	1.000	
Paraguay	Silver	Peso	.4969	Currency: depreciated paper; exchange rate 1.550 per cent.
Persia	Gold	Achref	.0959	Silver circulating above its metallic value; exchange value of silver kran, approximately \$0.117.
"	Silver	Kran	.0915	
Peru	Gold	Libra	4.8665	
Philippine Islands	Gold	Peso	.5000	
Portugal	Gold	Escudo	1.0805	Currency: inconvertible paper; exchange rate, approximately, \$0.70½.
Rumania	Gold	Leu	.1930	
Russia	Gold	Ruble	.5146	
San Domingo	Gold	Dollar	1.0000	
Serbia	Gold	Dinar	.1930	
Siam	Gold	Tical	.3709	
Spain	Gold (b)	Peseta	.1930	Valuation is for the gold peseta; currency is silver circulating above its metallic value; exchange value, approximately, \$0.20.
Straits Settlements	Gold	Dollar	.5678	
Sweden	Gold	Crown	.2630	
Switzerland	Gold	Franc	.1930	Member Latin Union; gold is actual standard.
Turkey	Gold	Piaster	.0440	100 piasters equal to the Turkish £.
Uruguay	Gold	Peso	1.0342	
Venezuela	Gold	Bolivar	.1930	

(a) The exchange rates shown under this heading a values of currencies which are fluctuating in their relative place of the Consular certificate where it is available.

palachian region, and West Virginia and Massachusetts. Pennsylvania contributed nearly 62 per cent of the total output of the United States in 1914. The average value per ton of the coke manufactured was \$2.54.

The coke output of the United States broke all records in 1916. More than 35,000,000 tons of bee-hive coke were manufactured, an increase of over 27 per cent, compared with 1915, and 500,000 tons more than the record-breaking total in 1910. By-product coke amounted to 19,200,000 tons, an increase of more than 5,000,000 tons, or 36 per cent, compared with 1915. The

recent quotations and given as an indication of the value to the legal standard. They are not to take the (b) And silver.

total coke produced in 1916, according to the estimates of the United States Geological Survey, was 54,300,000 tons, an increase of 30 per cent over the production of 1915.

The manufacture of by-product coke is important for its effect on the dyestuff and chemical situation produced by the European war and discussed under CHEMISTRY, INDUSTRIAL. It was estimated that 27,500,000 tons of coal were used in the manufacture of by-product coke in 1916; that 270,000 net tons of ammonium sulphate, 192,000,000 gallons of tar, and 35,600,000 gallons of light oils were recovered; and that

the surplus gas amounted to 118,000,000,000 cubic feet. These estimates are summarized in the following table:

BY-PRODUCTS OBTAINED IN MANUFACTURE OF COKE 1915 AND 1916

	1915	1916	Percent- age of increase
Surplus gas, M cu. ft.	84,355,914	118,000,000	40
Tar, gallons	138,414,601	192,000,000	39
Ammonium sulphate, tons	197,128	270,000	37
Light oil, gallons	16,600,657	85,600,000	110

**COLD STORAGE.** See **FOOD AND NUTRITION; PRICES.**

**COLGATE UNIVERSITY.** A non-sectarian institution for the education of men, founded at Hamilton, N. Y., in 1819. It comprises two departments, college and Baptist Theological Seminary. At the end of 1916 the enrollment of students was 615, while the faculty numbered 50. During the year construction work was begun on a new chapel, a gift to the university. George O. Ferguson, Jr., was appointed associate professor of psychology and education. In the library were 80,000 volumes. President, Elmer Burritt Bryan.

**COLLEGES.** See **UNIVERSITIES AND COLLEGES.**

**COLLEGES, AGRICULTURAL.** See **AGRICULTURAL EDUCATION.**

**COLLISIONS.** See **RAILWAY ACCIDENTS.**

**COLOMBIA.** A northwestern republic of South America, bordering the Pacific Ocean and the Caribbean Sea and bounded by Panama, Venezuela, Brazil, Peru, and Ecuador. The capital is Bogotá.

**AREA AND POPULATION.** Estimates of area differ widely, as most of the Brazilian frontier is undefined, and a large extent of territory claimed by Colombia is also claimed by both Peru and Ecuador. The most satisfactory estimate at present is about 435,000 square miles. The census of March 5, 1912, showed a population of 5,472,604, as compared with 4,533,777 in 1905. These figures include some estimates and also the population of Panama, which appears in the 1912 census with an estimated 400,000. With this figure deducted, the population of Colombia in 1912 becomes 5,072,604. Panama, formerly the northwestern department of the republic, declared its independence Dec. 4, 1903. In a treaty with the United States, signed April 6, 1914, it was agreed that Colombia recognize the independence of Panama and that the United States pay to Colombia \$25,000,000. This treaty was finally ratified by the United States Senate on Feb. 2, 1916. See **UNITED STATES, Treaties.**

The following figures show the population of the larger cities and towns as returned by the 1912 census (the figures relate to *municipios*, which usually comprise rather extended areas): Bogotá, 121,257; Medellín, 71,004; Barranquilla, 48,907; Cartagena, 36,632; Manizales, 34,720; Sonrón, 29,346; Pasto, 27,760; Cali, 27,747; Aguadas, 26,423; Ibagué, 24,693; Palmira, 24,312; Neiva, 21,852; Montería, 21,521; Yarumal, 21,250; Cúcuta, 20,364; Bucaramanga, 19,735; Miraflores (Boyacá), 19,150; Lorica, 19,005; Popayán, 18,724; Cartago, 18,618.

**EDUCATION.** Primary instruction, though free, is not compulsory, and illiteracy is prevalent. The reported number of primary schools in 1915

was 4535, with 305,581 pupils. Secondary schools, most of which are under the management of Roman Catholic orders, numbered 301 in 1915, with 25,382 students. There were also reported 21 professional schools, with 2439 students, and 36 arts and trade schools, with 2924 students. Normal schools in 1914 numbered 28, with 1728 students (649 male, 1079 female). There are mining schools at Medellín and Pasto. Several universities have been established; by far the most important is that situated at Bogotá, a city which has long been a conspicuous seat of Roman Catholic scholasticism. The university has faculties of letters and philosophy, jurisprudence and political science, medicine and natural science, and mathematics and engineering. The state religion is Roman Catholicism.

**PRODUCTION.** Colombia has a vast amount of fertile soil, but only a small proportion has been brought under cultivation. Agricultural progress, as well as that of mining and of industry in general, is handicapped by inadequate means of communication and transportation. The most important crop commercially is coffee. The coastal and hot regions produce sugar cane, corn, cotton, and other fibres, bananas and other tropical fruits, cacao, and rubber, while the mountain and upland districts yield coffee, wheat, barley, potatoes, and other products of the temperate zone. Tobacco and ivory nuts are valuable products. A large proportion of the country is suitable for cattle raising, which in some sections, as along the Sinu River, is a large and profitable industry. Colombia's mineral resources are of exceptional importance, especially in the Department of Antioquia, and include gold, copper, lead, zinc, mercury, iron, coal, salt, platinum, and emeralds. At present the world's supply of emeralds comes almost entirely from Colombia, principally from the Muzo group of mines. In the production of platinum, Colombia ranks second only to Russia. Manufactures, except Panama (Jipijapi) hats, have not attained much importance, though there is some production of textile goods, glass, earthenware, matches, iron castings, sugar, and flour. The Panama hat industry has recently had a remarkable development.

**COMMERCE.** The outbreak of the great war, Aug. 1, 1914, caused a decline in Colombia's foreign trade, as in that of other South American countries. Imports and exports in 1915 were valued at \$18,658,178 and \$29,265,348 respectively, as compared with \$20,979,229 and \$32,632,884 in 1914. Import and export values for five years have been as follows, in thousands of dollars:

	1911	1912	1913	1914	1915
Imports	18,109	23,965	28,536	20,979	18,658
Exports	22,376	32,222	34,315	32,633	29,265

In 1913 and 1914 respectively, leading imports were valued as follows, in thousands of dollars: textiles, 11,455 and 6785; metal manufactures, 3164 and 2670; foodstuffs and condiments, 2817 and 1974; railway cars, carriages, wagons, etc., 1164 and 1028; wines, liquors, and other beverages, 1051 and 748; drugs and medicines, 947 in 1914; materials for the arts and trades, 904 and 461.

Quantity of leading exports in metric tons, in 1913 and 1914: coffee, 61,233 and 61,916; bananas, 143,078 and 130,071; tobacco, 6282 and

2639; cattle hides, 5235 and 4663; ivory nuts, 11,651 and 7121; rubber, 306 and 199. The value of the principal exports is given below, in thousands of dollars:

	1911	1912	1913	1914
Coffee .....	9,475	16,778	18,370	16,098
Gold .....	3,752	4,610	4,100	4,746
Bananas .....	2,172	1,997	3,060	2,988
Cattle hides .....	1,780	2,262	3,181	2,704
Panama hats .....	1,089	1,175	966	1,372
Tobacco .....	333	442	921	392
Ivory nuts .....	789	755	819	827
Rubber .....	901	736	378	175

Trade by countries, in thousands of dollars:

	Imports		Exports	
	1913	1914	1913	1914
United States .....	7,680	6,487	18,862	18,272
United Kingdom .....	5,887	6,346	5,566	5,875
Germany .....	4,012	2,570	3,216	1,779
France .....	4,409	1,249	798	468
Italy .....	726	625	.....	21
Spain .....	.....	570	.....	52
Belgium .....	499	408	594	77
<b>Total, including other..</b>	<b>28,536</b>	<b>20,979</b>	<b>34,315</b>	<b>32,633</b>

COMMUNICATIONS. Colombia's transportation facilities are very inadequate to the needs of the country. In general the roads are merely mule tracks, but some of the main thoroughfares have been made usable for ordinary vehicles and automobiles. The great river of Colombia, the Magdalena, is impassable at several points on account of rapids and has a bar at its mouth; but nevertheless, together with its tributaries, it affords means for a considerable amount of traffic. There is no continuous railway system, but various short lines facilitate local transportation. A monograph issued by the Pan American Union in 1916 contained a list of these lines to the number of 16; their length varies from 16 kilometers (10 miles) to 174 kilometers (108 miles) and the aggregate length in operation is 1113 kilometers (692 miles). According to another authority, the total length of railway in operation is 708 miles. The Department of Public Works of the Colombian government made a contract during the year for the extension of the Ferrocarril del Noroeste (Northwestern Railroad) from Nemocon to Saboya, a distance of some 75 kilometers (47 miles). The contractors were given an option to continue the construction to San Gil, in the Department of Santander, about 140 kilometers (87 miles) farther. During the year the Colombian Congress authorized government loans for a sum not to exceed \$400,000, to be used in the extension of the Tolima Railway to Ibague. The loan was to be guaranteed by a mortgage on the railway, including the part already constructed. The usual interest rates and the amortization were to be covered by the proceeds of the railway, secured by 2 per cent of the proceeds of the Atlantic custom houses. The Minister of Public Works of Colombia adopted for the proposed railway from Cali to Popayan the route recommended by a committee of the Colombian Society of Engineers. This route, almost wholly in the valley of the Cauca River, was found to be the shortest and most practicable of the routes suggested by the Pacific Railway in a report to the Colombian government in 1915. The completion of the railway to Popayan, the capital of the Department of Cauca and the terminus of an old commercial road running south through Ecuador, would open

an important region to commerce through the port of Buenaventura. Reported length of government telegraph lines, about 12,000 miles, with 524 offices; post offices, 655.

FINANCE. The monetary unit is the peso, equivalent to the American dollar. Silver coins fluctuate in value more or less with the price of silver. The value of the paper peso is fixed by law at one one-hundredth of the monetary unit, but its actual purchasing power is somewhat variable; in 1915 the exchange rate was approximately 105 pesos paper to one peso gold. Estimated revenue and expenditure for 1914, 13,344,769 and 14,771,757 pesos gold respectively; for 1915, 11,942,707 and 15,143,143. The larger items of estimated revenue for 1915 were: customs, 9,716,306 pesos gold; salt tax, 1,055,723; telegraphs, 529,053; stamps, 475,184; consular dues, 447,407. Foreign debt, Jan. 1, 1916, \$3,847,948; internal debt, July 1, 1915, 5,169,770 pesos gold. There is an enormous outstanding paper currency.

GOVERNMENT. The executive authority is vested in a president, elected for four years by direct vote and assisted by a cabinet of eight members. There is no vice-president, but two *designados*, first and second, are elected annually by the Congress to succeed to the presidency in case of the chief executive's death or disability. The legislative power is exercised by a congress of two houses, the Senate and the House of Representatives. Senators (35 in number) are elected by indirect vote for four years; representatives (92) are elected by direct vote. The President in 1916 was José Vicente Concha, who was inaugurated Aug. 7, 1914, in succession to Carlos E. Restrepo.

Colombia having applied to the Swiss government for the services of three Swiss officers during a period of three years in organizing the Colombian army after the Swiss model, a military mission was appointed in Switzerland. It was announced on August 28th that the mission, which would consist of officers of the Swiss army, would soon leave for Colombia, in order to reorganize the military service.

COLORADO. POPULATION. The estimated population of the State in December, 1916, was 975,190. The population in 1910 was 799,024.

The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn .....	1916 475,000	7,362,000	\$6,626,000
	1915 470,000	11,280,000	6,204,000
Wheat .....	1916 600,000	11,885,000	17,828,000
	1915 560,000	18,310,000	10,648,000
Oats .....	1916 290,000	9,570,000	5,742,000
	1915 300,000	11,700,000	4,797,000
Potatoes ...	1916 50,000	6,900,000	9,315,000
	1915 53,000	7,155,000	3,935,000
Hay .....	1916 970,000	1,988,000	21,868,000
	1915 970,000	2,134,000	16,218,000
Rye .....	1916 28,000	392,000	412,000
	1915 30,000	525,000	368,000
Barley .....	1916 160,000	5,120,000	4,198,000
	1915 130,000	4,680,000	2,246,000

MINERAL PRODUCTION. The production of gold in the State in 1915 was valued at \$22,330,000. There were produced also 7,027,972 fine ounces of silver, 66,664,000 pounds of lead, 7,100,000 pounds of copper, and 100,000,000 pounds of zinc. The total value of these metals was \$43,500,000. The gold produced showed

an increase of \$2,447,000, silver a decrease of 1,716,000 ounces, lead a decrease of 7,550,000 pounds, copper an increase of 603,000 pounds, and zinc an increase of over 200,000 pounds. The net increase in the value of all metals was about \$10,000,000. In the production of gold Colorado ranks second, and is surpassed only by California.

The coal production of the State in 1915 was 8,624,980 short tons, valued at \$13,599,264, an increase of 454,421 tons, or 5½ per cent as compared with 1914. In spite of the increase in the production, the total value remained about the same, due to a smaller price in 1915. There were employed in the coal mines of the State in 1915 12,372 men, compared with 10,098 in 1914. There were no labor disturbances during the year. The State is a considerable producer of petroleum. There were marketed in 1915, 208,475 barrels, which was an increase of about 6 per cent over the corresponding output for 1914.

The output of gold, silver, copper, lead, and zinc in the State in 1916, according to estimates of the United States Geological Survey, amounted to \$18,940,000 in gold, 7,620,000 ounces of silver, 70,200,000 pounds of lead, 8,600,000 pounds of copper, and 130,000,000 pounds of zinc, with a total value of nearly \$49,000,000, compared with a total value of about \$43,500,000 in 1915. There was a decrease in gold, but increases in silver, copper, and zinc. The gold output of Cripple Creek was \$11,800,000, a decrease of \$1,883,000.

See ARBITRATION, INDUSTRIAL.

**TRANSPORTATION.** The total miles of main track of railroad operated in the State on June 30, 1916, was 5646. The total mileage of tracks of all kinds was 7663. The railroads having the longest mileage were the Denver and Rio Grande, 1578; Colorado and Southwestern, 808; the Union Pacific, 591; and the Atchison, Topeka, and Santa Fe, 505.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions of the State include the State Home for Dependent and Neglected Children, Soldiers' and Sailors' Home, Industrial Workshop for the Adult Blind, State Home and Training School for Mental Defectives, State Insane Asylum, the Industrial School for Boys, Industrial School for Girls, the State Penitentiary, and the State Reformatory. The total population of these institutions on Oct. 30, 1915, was 3012. The total expenditure for their maintenance during the year was \$672,884.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments ..	2,034	2,126
Average number of wage earners .....	28,087	27,278
Capital invested .....	\$162,668,000	\$181,776,000
Wages .....	19,912,000	20,200,000
The value of materials used.	80,491,000	89,756,000
The value of products.....	130,044,000	136,889,000

**POLITICS AND GOVERNMENT.** There was no session of the Legislature in 1916, and there were no incidents in the history of the State of

special interest aside from the campaign. Colonel Roosevelt made an address at Denver. (See UNITED STATES, *Presidential Campaign*.) In spite of his efforts, and those of the other Republican speakers, the vote was carried for Wilson by a large plurality, and the entire Democratic State ticket was elected. The Legislature, however, has a Republican majority of one. Mr. Wilson received 178,816 votes, and 102,308 were cast for Mr. Hughes. In 1912 Wilson received 114,232 votes, Taft 58,386, and Roosevelt 72,306.

**STATE OFFICERS.** Governor, Julius C. Gunter, Dem.; Lieutenant-Governor, James A. Pulliam, Dem.; Secretary of State, James R. Noland, Dem.; Treasurer, Robert H. Higgin, Dem.; Auditor, Charles H. Leckenby, Dem.; Adjutant-General, Harry P. Gamble, Rep.; Attorney-General, Leslie E. Hubbard, Dem.; Superintendent of Education, Mary C. C. Bradford, Dem.; Commissioner of Insurance, E. R. Harper, Rep.

**JUDICIARY.** Supreme Court: Chief Justice, S. Harrison White; Justices, S. H. White, W. A. Hill, M. S. Dailey, Tully Scott, James E. Garrigues, James H. Teller, George W. Allen; Clerk, James R. Killian.

STATE LEGISLATURE.

	Senate	House	Joint Ballot
Republicans .....	18	89	57
Democrats .....	17	26	43
Republican majority..	1	13	14

**COLORADO, UNIVERSITY OF.** A State co-educational institution at Boulder, Col., founded in 1876. The students enrolled in the fall of 1916 numbered 1334 and the faculty were 200 in number. In June, Charles N. Meader, M.D., was appointed dean of the School of Medicine. The library contains 100,000 volumes. President, Livingston Farrand.

**COLORADO RIVER CONTROL.** See FLOODS.

**COLORED METHODISTS.** See METHODISTS, COLORED.

**COLTON, GEORGE RADCLIFFE.** An American administrator, died in Washington, D. C., April 7, 1916. He was born at Galesburg, Ill., in 1866, and after studying at Knox College in that State, spent five years as a ranchman in New Mexico. Afterward he was a member of the Nebraska House of Representatives (1889-90) and a national bank examiner, and served as lieutenant-colonel in the Philippines, where he organized and supervised, till 1905, the customs service at Manila. After two years in a similar capacity in Santo Domingo, he returned to the Philippines to be insular collector of customs, and he drafted the new tariff for the islands enacted in 1909. From the latter year till 1913, Mr. Colton was Governor of Porto Rico.

**COLUMBIA UNIVERSITY.** A non-sectarian educational institution in New York City, founded in 1754. In 1916 the total number of students in all departments, including extension teaching and the summer session, was 18,176, the net total of students in the winter session being 11,912. The instructors in all departments, including extension teaching, summer session, Barnard College, Teachers College, and the College of Pharmacy, numbered 1042 in 1916. The library contains 661,650 bound

volumes. The productive funds (net investments) amount to approximately \$33,457,400, and during the last college year the total income from all sources was approximately \$5,362,550. The year was marked by a number of important faculty changes. Through resignation or expiration of term of appointment, the following severed their connection with the university: Francis M. Burdick, Dwight professor of law; William H. Burr, professor of civil engineering; Adolphe Cohn, professor of Romance languages and literatures; Camille Fontaine, assistant professor of Romance languages and literatures; George W. Kirchwey, Kent professor of law; Henry S. Redfield, Nash professor of law; William M. Sloane, Seth Low professor of history. By death the university lost: Seth Low, a former president and later a trustee; Edward Van Dyke Robinson, professor of economics; Frank Dempster Sherman, professor of graphics; Anton Vorisek, professor of analytical chemistry; Francis Brown, member of the university council; John McLean Nash, university treasurer. New appointments were: James C. Egbert (director, School of Business); Roswell P. McCrea (economics); Garrard Glenn (law); A. G. H. Spiers (French); Underhill Moore (law); Hastings Lyon (finance); Robert H. Montgomery (accounting); H. Parker Willis (banking); Charles D. Hazen (European history); Frederick A. Goetze (treasurer); Young B. Smith (law). Profs. Gustave Lanson and E. de Martonne were the visiting French professors, and Prof. Federico de Onis was entertained as visiting Spanish professor.

The most important gift of the year was \$600,000 from an anonymous donor for the construction of a building to house the School of Business. Mr. Jacob H. Schiff provided for a new Barnard Students' Building. (See BARNARD COLLEGE.) From the estate of E. C. Bondy \$100,000 was received. For the new School of Dentistry, plans for which are still somewhat tentative, \$125,000 has been received, \$100,000 of this from James N. Jarvie. Students have been registered, for the first two years of the dental course, in the College of Physicians and Surgeons. Women are to be admitted to the Medical School beginning in 1918. See also TEACHERS COLLEGE; UNIVERSITIES AND COLLEGES.

**COMETS.** See ASTRONOMY.

**COMMERCE.** For foreign trade, see UNITED STATES and articles on foreign countries; for internal trade, see UNITED STATES and articles on various industries; see also FINANCIAL REVIEW.

**COMMERCE COMMISSION, INTERSTATE.** See RAILWAYS.

**COMMERCIAL BUILDINGS.** See ARCHITECTURE.

**COMMISSION FOR RELIEF IN BELGIUM.** See RELIEF FOR WAR VICTIMS.

**COMMISSION ON INDUSTRIAL RELATIONS.** See INDUSTRIAL RELATIONS COMMISSION.

**COMMISSION PLAN OF GOVERNMENT.** See MUNICIPAL GOVERNMENT.

**COMORO ISLANDS.** See MAYOTTE AND THE COMORO ISLANDS.

**COMPENSATION FOR WORKMEN.** See WORKMEN'S COMPENSATION.

**CONCILIATION, INDUSTRIAL.** See ARBITRATION AND CONCILIATION, INDUSTRIAL.

**CONCRETE.** An important publication in-

volving results and conclusions based on some 20,000 tests of mortar and concrete specimens appeared during the year in the United States Bureau of Standards Technologic Paper No. 58, entitled *Strength and Other Properties of Concretes as Affected by Materials and Methods of Preparation*. This paper gave conclusions drawn from about 20,000 tests as to the effect on the properties of concretes and Portland cement mortars of varied conditions and constituents of fabrication. The value of knowing thoroughly the constituents was emphasized, and methods of proportioning and graduation discussed. With the percentage of the cement to the total aggregate fixed, the strength was found to vary as to the density of the mixture.

Varying one factor at a time, extensive experiments were made by the chemists and engineers of the Bureau of Standards to determine with precision the effects of consistency, of age, of density and proportions of the mix, of the nature of the aggregates, of the methods of mixing and placing, and of the manner of curing. It was demonstrated that often greater compressive strength with less cost would result from employing other than the usual standard proportions, such as the 1:2:4 mix so commonly used. Concretes differing widely in composition from Fuller's ideal curve gave high strength, and it was demonstrated that the maximum density curve varied for every aggregate and combination of aggregates. The paper may be secured from the Bureau of Standards at Washington.

**INSTRUCTION FOR CONCRETE WORKERS.** It was announced in the summer of 1916 that with the coöperation of the Portland Cement Association courses of instruction for concrete foremen and contractors would be started by the Wentworth Institute in Boston with the aim of practically training boys and young men for future careers along these lines. The institute set aside one of its best laboratory rooms for the new concrete course, fitting it up with modern testing machinery and other necessary equipment for making various determinations that would illustrate the technical as well as the practical sides of concrete engineering. J. C. Donaldson, Field Engineer of the Extension Division of the Portland Cement Association, was located at the Wentworth Institute, assisting in the necessary preliminaries and afterward in starting and directing the course along the lines planned.

At the various testing and other laboratories much important work was being done on cement and concrete and this material continued to receive much attention as it was being so extensively used.

**A RECORD ERECTION.** The striking availability of reinforced-concrete as building material was shown in what was claimed as a world's construction record, when in 41 days' elapsed time or 25 working days' time, was built the reinforced-concrete frame for an eight-story building 100 x 400 feet. This building, which was constructed for the Baldwin Locomotive Works in Philadelphia, contained 15,000 cubic yards of concrete, exclusive of 5000 cubic yards in footings. The entire building of eight floors and the ground floor slab represented an area of 360,000 square feet, and one single floor was formed and poured in three days. The intense speed was demanded, as the building was to be

used for the manufacture of shells, casings, and other steel products. The work was laid out so that the various materials were delivered to the place needed by motor truck.

**A LARGE CONCRETE ELEVATOR.** An important record in the placing of concrete was made on August 23rd, when 1200 cubic yards were deposited in position in 20 consecutive hours in the construction of the 6,000,000-bushel grain elevator of the Armour Grain Co. on the Calumet River at Chicago. The storage portion of this elevator under construction consisted of 104 circular bins 106 feet high and 22½ feet in diameter. The continuous rising form method of construction was adopted, and for the entire bank of 104 tanks a rise of 1 vertical foot involved placing 168 cubic yards of concrete. The plant involved in this erection was especially designed and electrically operated to secure maximum efficiency.

**CONCRETE FOR PAVING.** The growth of the use of concrete for the paving of roads, streets, and alleys continued and according to the Portland Cement Association there were placed under contract in 1916 nearly 23,000,000 square yards of such construction.

**PATENTS DECLARED INVALID.** A decision in the United States District Court at Trenton, N. J., was recorded in which two Turner "mushroom" floor patents relating to the reinforcement of concrete in the construction of buildings were held invalid. This decision considerably cleared the field in the use of reinforced-concrete in building. There was also other litigation during the year involving different patents for reinforced-concrete, the Luten patent again being held invalid on August 28th in the United States District Court at Columbus, Ohio, Judge Sater concurring in the opinion expressed in the previous year by Judge Lewis in Colorado. The Thacher patent also was held invalid in the United States District Court of Southern Iowa. See BRIDGES; CEMENT; ROADS AND PAVEMENTS.

**CONDENSED MILK.** See MILK.

**CONFERENCES OF CHARITABLE AND SOCIAL ORGANIZATIONS.** See CHARITIES.

**CONFLAGRATIONS.** See FIRE PROTECTION.

**CONGO, BELGIAN.** A Belgian colony in central Africa (the former Congo Free State). The capital is Boma.

**AREA AND POPULATION.** The colony covers an area of 2,365,000 square kilometers (913,127 square miles); white population (Jan. 1, 1912), 5465. No official estimate of native population is given; other sources vary from 9,000,000 to 20,000,000. Besides Boma, important towns are Matadi, Banana, Leopoldville, Stanleyville, Kambove, Niangara, Bandundu, etc. The natives, chiefly of Bantu origin, practice fetichism.

**PRODUCTION AND COMMERCE.** Rubber is the leading article of production and export. The Kilo gold mine has eight experts and 1750 negro workers, and produced in 1910, 867 kilograms of gold. Gold is also found in the Katanga district.

Sale of crown lands in 1910, about 14 hectares, at a total price of 241,528 francs; crown lands rented in 1910, 4062 hectares, rental 18,345 francs. A large proportion of these lands is in the Katanga district.

In 1912 the imports in the special trade were valued at 54,233,000 francs and the exports at 59,926,000; in the general trade, at 62,229,000 and 84,266,000 francs respectively. Principal

exports for comparative years are given below, values in thousands of francs:

	1910	1911	1912	1913
Rubber .....	51,016	34,427	34,519	27,520
White copal .....	8,348	1,814	6,385	8,935
Ivory .....	6,056	5,683	5,552	11,675
Copper .....	.....	1,834	4,112	3,685
Gold .....	2,515	3,119	8,382	6,000
Palm nuts .....	2,657	2,879	2,771	4,844
Palm oil .....	1,798	1,732	1,253	1,842
Cacao .....	1,071	896	1,115	1,036

Imports for consumption include arms and ammunition, 1,148,178 francs in 1912 and 819,201 in 1913; cottons, 1,753,119 and 10,417,756; foodstuffs, 9,582,697 and 8,680,966; machinery, 6,018,653 and 7,916,711; metals, 7,674,857 and 6,580,063; wines and liquors, 3,608,987 and 3,086,811; etc. Countries of origin and destination in the order of their importance are Belgium, Great Britain, Germany, Netherlands, France, etc.

**RAILWAYS.** Railways in operation Jan. 1, 1913, 1390 kilometers. The Cape-to-Cairo Railway was operating through trains from Cape Town to Kambove, North Elizabethville. The next stretch is from Kambove to Bukama, a distance of 204 miles by the recently adopted route, of which 86 miles had been completed at the end of March, 1915, and the roadbed finished some 10 miles more, but work was then proceeding slowly on account of the difficulty of receiving materials. From Bukama there was an all rail and water route to Boma, and when the Kambove-Bukama section was completed direct communication with comparative comfort would be maintained from Cape Town through central Africa to Boma and Banana on the Atlantic coast.

**FINANCE AND GOVERNMENT.** The 1914 budget calculated the revenue at 30,451,276 francs and the expenditure at 63,075,573. The debt stood (1912) at 151,222,200 francs; loan of 1888, 99,780,000 francs; floating debt, 62,545,000 francs. The Governor-General in 1916 was E. J. M. Henrij.

**HISTORY.** In the angle where Belgian, French, and British boundaries meet, close to the frontier of the Sudan, a revolt broke out early in the year under one of the native chiefs. In February he attacked the French post of Mopoi, whose commandant was obliged to fall back to the post of Bangaro in Belgian territory. British forces under Major White occupied the post of Mopoi on the 16th, where they were attacked by the enemy. On March 17th a combined French and Belgian force on their way to Mopoi dispersed the insurgents, and on March 18th the forces combined in operations against the rebels, whom they completely defeated, killing, wounding, and capturing many of them. Among the prisoners was the chief.

**CONGO, FRENCH.** See FRENCH EQUATORIAL AFRICA.

**CONGO FREE STATE.** See Congo, BELGIAN.

**CONGREGATIONALISM.** According to official statements there were in this denomination in the United States in the beginning of 1916, 6103 churches, 5997 ministers, of whom 4001 were pastors and 1996 without charges, 780,414 members, and 766,103 pupils of Sunday schools. There were 3261 Young People's Societies, with 137,827 members; 1681 men's organizations, with 91,557 members. The total contributions to all branches of the work of the



denomination were \$1,895,662. The home expenses of the churches of the denomination were \$10,382,503. The amount of the salaries paid was \$5,265,332, an average of \$1059. The value of church property was \$86,091,528; invested funds amounted to \$10,565,456; debts, \$4,308,534. The national societies include the Congregational Educational Society, the American Board of Commissioners for Foreign Missions, the Congregational Home Missionary Society, the American Missionary Association, the Congregational Church Building Society, the Congregational Board of Ministerial Relief, and the Congregational Sunday School and Publishing Society.

The woman's work of the denomination centres in the Woman's Home Missionary Federation as representing the homeland societies, and in the Woman's Board of Missions, as representing the foreign activities. The report of the Board of Commissioners for Foreign Missions showed that the war had brought added encroachments on its work and heavily increased its burdens, especially in Turkey. There buildings were seized or destroyed; teachers, students, and even entire communities were exterminated. The mission in the Balkans was also disturbed. In Prague, notwithstanding bad conditions, the work was succeeding. Excellent results had also been attained in Japan, China, India, and to some extent in Africa. The board's receipts were \$1,101,570, the largest of any year in its history. The total cost of missions abroad for the year was \$1,163,318. The Home Missionary Society carried on work in 27 States and Territories, and the constituent State societies in 18 more. The number of missionaries was 1774, who cared for 2345 churches and preaching stations. Connected with these churches were 2265 Sunday schools. The receipts of the society and its auxiliaries were \$641,727.12; expenditures, \$648,190.36. During the year 83 new churches were organized, 70 new church buildings erected, and 27 parsonages built. There were 10 theological seminaries with 68 professors and 537 students. The general administration of the Church is under the control of the National Council. The social work is in the hands of the Social Service Commission of the Congregational Church, which is a development from the work of the Department of Labor and Social Service of the Congregational Brotherhood of America. The officers of the National Council for 1915-17 were: Moderator, Hon. H. M. Beardsley; assistant moderators, Rev. W. H. Day and Rev. Alfred Lawless, Jr.; secretary, Rev. H. C. Herring; treasurer, Rev. John J. Walker.

Outside of the United States the number of Congregational churches, chapels, and stations was 12,378, with a membership of 1,141,724, and a Sunday school membership of 1,721,983. Of this total Great Britain and Ireland had 5016 churches, chapels, and stations, 493,378 church members, and 741,046 members of Sunday schools. Canada had 152 churches, chapels, and stations, 12,030 church members, and 9363 Sunday school members. Australia had 470 churches, etc., 21,229 church members, and 36,898 Sunday school pupils.

**CONGREGATIONAL METHODIST CHURCH.** This was a seceding body from the Methodist Episcopal Church, South. In 1852 there arose, because of objection to certain fea-

tures of the episcopacy and itinerary, a company desiring a more democratic form of government. In May of that year a conference was held at Forsyth, Ga., where they adopted the Congregational form of government, but "modified by a certain degree of connectionalism" and chose the name Congregational Methodist Church. In 1916 they had in the United States 196 churches, 220 ministers, and 10,969 members. Their official organ is *The Messenger*, published in Ellenville, Miss., Rev. G. C. Van Devender, editor.

**CONGRESS.** See UNITED STATES.

**CONNECTICUT. POPULATION.** The estimated population of the State in December, 1916, was 1,254,926. The population in 1910 was 1,114,756.

**AGRICULTURE.** The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture in 1915-16 were as follows:

		Acreage	Prod. Bu.	Value
Corn	1916	63,000	2,709,000	\$3,251,000
	1915	65,000	3,250,000	2,762,000
Oats	1916	15,000	450,000	310,000
	1915	18,000	422,000	282,000
Potatoes	1916	22,000	2,090,000	3,658,000
	1915	24,000	2,280,000	3,189,000
Hay	1916	370,000	574,000	10,619,000
	1915	365,000	a 493,000	9,860,000
Tobacco	1916	22,200	36,186,000	9,770,000
	1915	22,000	b 29,970,000	5,995,000
Rye	1916	7,000	137,000	171,000
	1915	7,000	150,000	158,000

a Tons. b Pounds.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments..	4,251	4,104
Average number of wage earners .....	210,792	226,264
Capital invested .....	\$517,546,000	\$620,194,000
Wages .....	110,119,000	125,220,000
The value of materials used.	257,259,000	288,511,000
The value of products.....	490,272,000	545,472,000

**TRANSPORTATION.** The total railway mileage of the State in 1916 was 999 miles. This includes mileage of all kinds. During the year the New York, New Haven, and Hartford Railroad Company completed a number of sidings and track facilities in several divisions in the State. It also added two tracks between Westbrook and Saybrook Junction. This represents practically all the railway construction during the year. The New York, New Haven, and Hartford has 850 miles of track in the State, the Central New England 83, and the Central Vermont 58.

**EDUCATION.** The total enrollment in the public schools in the State in 1916 was 218,459. The average daily attendance was 175,881. There were 349 regular men teachers and 5986 regular women teachers. The supervising principals numbered 71 men and 502 women. Teachers of special subjects numbered 74 men and 158 women. The average monthly salary of regular men teachers was \$122.70, of regular women teachers \$64.32. The monthly salary of supervising principals averaged \$193.66 and for women \$113.97. For teachers of special

subjects the average was \$90.38 for men and \$61.86 for women.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include the Soldiers' and Sailors' Home at Noroton Heights, Connecticut Hospital for the Insane at Middletown, Norwich State Hospital for the Insane, Connecticut State Prison at Wethersfield, Connecticut School for Boys at Meriden, Connecticut Industrial School for Girls at Middletown, Connecticut Colony for Epileptics at Mansfield, and Connecticut School for Imbeciles at Lakeville.

**POLITICS AND GOVERNMENT.** The political situation in Connecticut in 1916 was a peculiar one. Governor Holcomb, who had not sought the nomination in 1914, was understood not to want it again, and George P. McLean, whose term as United States Senator expired on March 4, 1917, had said that he was not anxious to return to the Senate. In spite of their individual desires both men were renominated, with the entire Republican State ticket with the single exception of a Secretary of State. The Democrats nominated for Governor, Morris Beardley, of Bridgeport, for many years probate judge in that city, and for United States Senator, Homer S. Cummins, State Attorney of Fairfield County. As the campaign progressed rumors spread that the State had become doubtful. The chief reason for this view which was given out at the New York headquarters of both parties was that a large number of skilled workmen had come into Connecticut to the munition factories, and it was held that a desire to continue the present conditions would lead them to vote the Democratic ticket. In spite of this forecast the Republicans carried the State by a plurality of about 12,000. Mr. Hughes's plurality was 6728. Senator McLean received a plurality of 8371 votes. In one district a Democratic representative to Congress was elected, but in the four other districts four Republican members were elected. Governor Holcomb was reelected by a vote of over 12,000 plurality. The total vote of the State was 213,874 in 1916, compared with 194,581 in 1912. The Socialist vote was 5179, compared with 10,056 in 1912, and the Prohibition vote was 1789, compared with 2068 in 1912. Hartford and New Haven showed greater Democratic gains, and some other parts of the State showed gains by the Republicans.

**STATE OFFICERS.** Governor, Marcus H. Holcomb; Lieutenant-Governor, Clifford B. Wilson; Secretary of State, Frederick L. Perry; Treasurer, Frederick S. Chamberlain; Comptroller, Morris C. Webster; Attorney-General, George E. Hinman; Adjutant-General, Brig-Gen. George M. Cole; Commissioner of Insurance, Burton Mansfield—all Republicans except Mansfield and Bennett, not stated.

**JUDICIARY.** Supreme Court: Chief Justice, Samuel O. Prentice; Associate Justices, George W. Wheeler, John M. Thayer, Alberto T. Roraback, John K. Beach; Clerk, George A. Conant.

STATE LEGISLATURE.

	Senate	House	Joint Ballot
Republicans .....	25	195	220
Democrats .....	10	64	74
Republican majority..	15	131	146

**CONNOLLY, JAMES.** An Irish Nationalist leader, executed May 12, 1916, in Dublin, for

his part in the Sinn Fein revolt of the preceding April. He was born in the Dublin slums and was early a laborer, but he managed to acquire command of several languages and he studied history, economics, and politics, subjects which, taken together with a natural oratorical gift, made him an able speaker. He came to the United States in 1902 and lectured for the Socialist Labor Party, and from 1903 to 1908 was again in this country, lecturing, working as a labor organizer, and editing *The Harp*, a monthly advocating Socialism among the Irish in America. He returned to Ireland with the avowed intention of bringing about a union of the workers of Northern and Southern Ireland. With Larkin and Lehane, Connolly became active as a leader in the industrial union or syndicalist Socialist movement. He edited the chief Dublin labor paper. Connolly and his group became affiliated with the Sinn Feiners, and he it was who was chosen "general in chief of the armies of the Irish Republic" when the 1916 revolt was planned. He was wounded during the fighting, was captured and imprisoned, tried, and sentenced to death.

**CONRAD, JOSEPH.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction and Essays, etc.*, English.

**CONSERVATION OF FOOD.** See AGRICULTURE.

**CONSERVATION OF NATURAL RESOURCES.** See DRAINAGE; FORESTRY; IRRIGATION.

**CONSTANTINE, KING OF THE HELLENES.** See GREECE, *History*; WAR OF THE NATIONS.

**CONSULAR SERVICE.** See UNITED STATES.

**CONSUMPTION.** See TUBERCULOSIS.

**CONTAGIOUS ABORTION.** See VETERINARY MEDICINE.

**CONTAGIOUS DISEASES.** See VITAL STATISTICS.

**CONTRABAND OF WAR.** The conditions as to contraband goods have materially altered since the article which appears in the YEAR BOOK for 1914 was prepared. The first important change was the transfer of cotton (Aug. 22, 1915) from the British free list to absolute contraband. This was to be expected and might properly have taken place sooner, for modern gunpowder is made almost wholly of cotton. The next move of the Entente Allies was to institute a more rigorous investigation of neutral mails on the ground that large quantities of valuable contraband goods were sent through them. Early in 1916 the following statement appeared in the British press:

"The Allied governments announce that whereas both the 'Letter Post' and the 'Parcel Post' have been used by the enemy for the transmission of contraband packages, and whereas Convention XI of the Hague Conference of 1907 relating to the immunity of the mails cannot be held to apply to other than *bona fide* postal correspondence:

"(1) As regards the right of search, and eventually of arrest and seizure, goods dispatched as postal packages cannot and will not be treated otherwise than goods dispatched in any other form;

"(2) The immunity of postal correspondence, as stipulated by the 11th Hague Convention of 1907, in no wise affects the right of the Allied governments to examine, and if necessary to ar-

rest and seize, goods concealed in wrappers, envelopes, or letters contained in mail bags;

"(3) The Allied governments, faithful to their engagements and duly respectful of genuine 'correspondence,' will continue, for the moment, to abstain from seizing on the high seas and confiscating such communications, letters, or dispatches, and will insure their transmission with all possible expedition, as soon as their genuine character has been established."

On April 19, 1916, the British government issued a new contraband list. The prefatory announcement states that for all practical purposes the distinction between the two classes of contraband [absolute and conditional] has ceased to have any value "in view of the fact that the enemy country has taken over control of practically all the articles that appear on the list of conditional contraband."

On July 7th, an Order in Council was published withdrawing all orders theretofore issued under the Declaration of London, and thereby abandoning adherence to that Declaration. The new order declares it to be the intention of Great Britain and her allies to exercise their belligerent rights at sea in strict accordance with the law of nations. On account of the changed conditions of commerce and the diversity of practice, doubts might arise in certain matters as to the rules which the Allies might regard as in conformity with the law of nations, and it is ordered that the following provisions be observed:

*First*—The hostile destination required for the condemnation of contraband articles shall be presumed to exist until the contrary is shown if the goods are consigned to or for an enemy authority or agent of an enemy state, or to or for a person in the territory belonging to or occupied by the enemy, or to or for a person who, during the present hostilities has forwarded contraband goods to an enemy authority or agent of an enemy state, or to or for a person in territory belonging to or occupied by the enemy, or if the goods are consigned 'to order' or if the ship's papers do not show who is the real consignee of the goods.

*Second*—The principle of continuous voyage or ultimate destination shall be applicable both in cases of contraband and blockade.

*Third*—A neutral vessel carrying contraband with papers indicating a neutral destination which, notwithstanding the destination shown on the papers, proceeds to an enemy port, shall be liable to capture and condemnation if she is encountered before the end of her next voyage.

*Fourth*—A vessel carrying contraband shall be liable to capture and condemnation if the contraband, reckoned either by value, weight, volume, or freight, forms more than half of the cargo."

On the same day the French government issued a similar memorandum and promulgated the same rules.

In a long note of 13,000 words, issued in April, the British government defends its orders in regard to regulating commerce to neutral countries contiguous to Germany and offers evidence in proof of the effectiveness of her blockade against Germany. In support of the claim that a large portion of the goods sent to Holland and Scandinavian countries finds its way to Germany, it cites the United States

figures which show that the exports to these countries increased from \$97,000,000 in 1913 to \$235,000,000 in 1915. This presentment, if unopposed by other data, creates a presumption in favor of the British contention; but, if the imports of similar goods from other countries are decreased by approximately equivalent amounts, the presumption is destroyed. The note of April 25th also cites evidence of false consignments to dock laborers, bakers, etc.; and it invites attention to the American doctrine of "continuous voyage." See UNITED STATES AND THE WAR; WAR OF THE NATIONS.

**COOK, ALBERT J.** See HORTICULTURE, *Necrology*.

**COOK, FRANCIS AUGUSTUS.** An American naval officer, died Oct. 8, 1916, at Northampton, Mass. He was born in the same town, in 1843. At 20 he graduated from the United States Naval Academy, then for two years, till the end of the Civil War, served with the western Gulf blockading squadron. For three years (1880-83), with the rank of commander, he had charge of the department of seamanship at Annapolis. As captain, he became commander of the cruiser *Brooklyn* in 1896, and it was in this connection that he became best known, for he was with Commodore Schley's "flying squadron" at the battle of Santiago Bay, and drove the Spanish vessel *Christóbal Colon* ashore. He was commended for "eminent and conspicuous conduct in battle" and was promoted to rear admiral. After the war and until his retirement in 1903, Admiral Cook served on the Naval Examining and Retiring Board. In the Sampson-Schley controversy he maintained officially due loyalty to his chief, but it was known that he considered Admiral Sampson entitled to credit for the victory at Santiago.

**COOK, WALTER.** An American architect, died March 25, 1916, in New York. He was born in the same city in 1846, and practiced his profession there from 1877. In that year he returned from abroad, having studied at the Munich Polytechnic and the Beaux-Arts, Paris. He had earlier (1869) graduated from Harvard. Mr. Cook, as a member of various firms, shared in the designing of various important buildings, including the New York home of Andrew Carnegie, the choir school of the Cathedral of St. John the Divine, also in New York, the stadium and other buildings for the Pan American Exposition, office, library, and other structures. He was a member of the jury for the New York Public Library and of the New York Court House Board; president of the American Institute of Architects (1912-13) and of other organizations; member of the National Academy of Design; and chevalier of the French Legion of Honor.

**COOLIDGE, MRS. ELIZABETH S.** See MUSIC, sections *Orchestras* and *Chamber Music*.

**COÖPERATION.** One of the most notable economic developments of the past few years has been the increase in the United States of co-operative undertakings. The term coöperation thus used does not mean the mutual loyalty of employers and employees in capitalistic industry, but rather combinations of producers or consumers who enter as equals into an organization to lessen competition, eliminate middlemen's profits, and reduce costs of distribution. Beginning with small groups of workmen who club together to purchase their household

supplies, the coöperative idea has extended to many forms of consumers' clubs, producers or selling associations, banking and credit societies (see AGRICULTURAL CREDIT and CREDIT UNIONS), and in fact nearly every form of industrial enterprise.

**UNITED STATES.** In this country the coöperative idea has taken root slowly, but nevertheless within a few years great numbers of coöperative buying clubs have been formed for the purchase of food products direct from farmers and wholesale merchants. It was estimated that in 1916 there were 200 such clubs in New York City alone and several thousand in the large cities east of the Mississippi River. These clubs vary in size from 20 to 300 members; they are frequently organized along racial lines, as Finns, Swedes, Italians, French, etc.; they issue no stock as a rule; do a strictly cash business; and claim to save from 10 to 20 per cent on purchases. In some cases employers of members of such clubs have carried the accounts on the firms' books. Such clubs have frequently had the incidental effect of reducing retail prices in their communities. Moreover, such clubs not infrequently become full developed coöperative stores. Such stores require members to purchase at least a small amount of stock; they sell to members and non-members at the same prices; and divide the profits annually or semi-annually among members in proportion to their purchases. Mr. N. O. Nelson of St. Louis has been instrumental in the formation of coöperative stores in St. Louis, New Orleans, and various small towns. Rural coöperative stores are still common, but on the whole they have not proved so successful as the urban stores. This fact is due largely to lack of business experience causing poor management, small capital, inadequate methods of bookkeeping, and in some instances to disloyalty of members. The latter element may be accounted for by the persistent individuality of the farmer, who, because of environment, is not so well socialized and hence not so much inclined to coöperation as the city dweller.

**Farmers.** Another aspect of coöperative development in this country has been the growth of both buying and selling organizations among the farmers. These purchase supplies at wholesale; own expensive machinery or breeding stock in common; and have even developed into credit unions (q.v.). As selling organizations they have been particularly successful among tobacco growers of Kentucky and Virginia, potato growers of Maine and Maryland, onion producers of Texas, fruit growers of the Pacific coast, wheat farmers of the Middle West and Northwest, and producers of milk, butter, and eggs in numerous sections. Such organizations require honest and efficient management, sincere loyalty and the spirit of coöperation on the part of members, and frequently must maintain their agents in principal selling markets.

**Coöperative Delivery Systems** have been established in numerous cities and large towns well scattered over the whole of the United States. So far they are not to be found to any great extent in large cities, which present a distinct problem in the delivery business. The chief advantages of the system of course are saving of time and labor, increase in promptness and rapidity of delivery, and reduction of the cost from 20 to 50 per cent. Thus at

Everett, Wash., the Merchants' Coöperative Delivery Company has a central station to which goods from coöperating stores are brought and then distributed according to districts at stated hours, 8 and 10 A.M. and 2 and 4 P.M. daily, except at 1.30, 3.30, and 5.30 P.M. on Saturdays. Before the establishment of this system, 41 stores used 45 vehicles for delivery; thereafter the same 41 stores used 15 vehicles, all overlapping of territory being eliminated.

**Coöperative Laundry.** A unique and successful form of coöperation is the coöperative laundry of rural sections, run frequently in connection with the local creamery. That at Chatfield, Minn., as described in the 1915 Year Book of the Department of Agriculture, has the same officers serving it and the creamery corporation. The latter owns the building and rents a part of it to the laundry company. This company is incorporated under the laws of the State with a capital of \$5000, and shares at \$5 each. There were 224 stockholders with only one vote each. The company pays 6 per cent dividends on all stock and then gives to the patrons a rebate of 10 per cent of the amount of business done with the laundry. Farmers do their own delivering, and their laundry bills are deducted from their cream checks each month. Laundry for town or city patrons is also done and is delivered C.O.D.

**EUROPE.** In all European countries coöperative organizations of numerous kinds have long been in operation. On the Continent this is notably true among farmers. In Switzerland, Denmark, Belgium, and Germany every rural activity from buying and selling supplies to education and musical and artistic efforts have been undertaken coöperatively. In Ireland agricultural coöperation under the leadership of Sir Horace Plunkett has accomplished a transformation of rural life during the last 15 years. In France coöperative societies are revitalizing country life; and similar results are being achieved in other parts of Europe, Siberia, and India. While the war has hindered the development of some phases of coöperation on the continent it has on the whole stimulated coöperative undertakings. Many societies in France and Belgium were broken up and their properties destroyed; but membership of coöperative societies in both countries everywhere increased whenever outside the range of actual warfare.

**Great Britain.** In 1915 there were reported in Great Britain 1500 coöperative societies, with 3,000,000 members, or about one-fourth of all the families. In that year these societies distributed several hundred million dollars' worth of goods; returned to their members \$85,000,000; owned \$300,000,000 worth of property; had invested in homes of members a total of \$50,000,000; and employed 150,000 persons. These numerous retail societies have been grouped under wholesale societies in England and Scotland which carry on an extensive printing and book-publishing business, own tea lands in Ceylon and distribute 25,000,000 pounds of tea annually, and produce flour for 15,000,000 consumers, being the largest flour millers in the United Kingdom and the greatest purchasers of Canadian wheat. They own olive groves in Africa, raise currants in Greece and raisins in Spain, manufacture soap, carry on an extensive food manufacturing industry, make watches, manu-

facture 3,000,000 pairs of shoes annually, carry life insurance for more than 1,000,000 of their members, and spend large sums for hospitals and relief for those suffering from strikes, famine, fire, and other disasters. The British wholesale society also does an annual banking business of \$800,000,000. It has taken the lead in the formation of the International Coöperative Alliance which includes similar wholesale societies of at least seven countries and representatives from 10 other countries. As in other countries at war, British coöperative societies maintained lower and more stable prices than other retailers. Consequently their membership greatly increased. While private landlords were increasing rents rapidly, coöperative societies maintained previous rates. Consequently these bodies with their membership scattered throughout the country supplied an irresistible basis for the agitation for government regulation of prices. During 1914 British local coöperative societies showed an increase of 10 per cent in sales, with a total of \$692,360,000; and the English wholesale society reported a 10 per cent increase, with a total of \$175,000,000. For 1915 an increase twice as great was reported.

*Germany.* The great scarcity and extraordinary prices for food products resulted in a great increase in the membership of coöperative retail societies in Germany. These organizations advanced prices less than other retailers. In consequence public employees, who previous to the war were not permitted to belong to such societies, secured privilege of membership. In Hamburg coöperative societies reported early in 1915 a total membership of 78,500, an increase of 10,000, and total sales of \$6,161,000, an increase of 5 per cent. The German wholesale society reported an increase in sales of 20 per cent over those of 1914.

**COPPER.** The copper production in the United States in 1916 surpassed all previous records, according to preliminary estimates made in December by the United States Geological Survey. The average price during the year was \$0.27 a pound, and at this price the output for the year had a value of \$520,000,000 compared with \$242,940,000 for the output of 1915, and \$189,790,000 in 1913. The output of blister and regular copper from domestic ores was 1,928,000,000 pounds in 1916 compared with 1,388,000,000 pounds in 1915, and 1,242,000,000 in 1913. The output of refined copper from primary sources, domestic and foreign, for the year 1916 is estimated at 2,311,000,000 pounds, compared with 1,634,000,000 pounds in 1915, and 1,615,000,000 pounds in 1913. The production of copper from the mines in 1916 was more than double that of 10 years previous, and more than four times that of 20 years previous. The profit resulting from the domestic production was far greater in 1916 than in any previous year. It probably exceeded \$300,000,000.

At the beginning of 1916 there were about 82,400,000 pounds of refined copper in stock in the United States. This quantity added to the refinery production gives the total available supply of about 2,393,000,000 pounds of refined copper. Deducting from this the exports for the first 10 months, and the estimated export for the last two months the supply available for domestic consumption is materially greater than the 1,043,000,000 pounds of 1915, no ac-

count of the stocks being taken at the close of the year. The average price of copper in 1916 showed a marked increase over that of the preceding year, being slightly above \$0.27 a pound, compared with \$0.174 in 1915.

Arizona ranks first among the States in production with a total of about 675,000,000 pounds as compared with 432,000,000 pounds in 1913. Montana with more than 350,000,000 pounds ranks second, and exceeded its previous record production of 314,900,000 pounds in 1912. The production of the State in 1915 was about 268,000,000 pounds. Michigan also made a record production. The output for 1916 was 269,000,000 pounds, compared with about 230,900,000 pounds in 1915. The production of Utah showed an increase of about 60,000,000 pounds over the previous record production of 175,000,000 pounds in 1915. The output from Alaska was estimated at over 120,000,000 pounds, compared with 70,600 pounds in 1915. The production in the State of Nevada was about 100,000,000 pounds. The largest previous production was 85,200,000 pounds in 1913. The production in 1915 was 67,700,000 pounds. New Mexico produced about 90,000,000 pounds, compared with 62,800,000 pounds in 1915. The production of California exceeded 60,000,000 pounds, a large increase over the previous record production of over 53,000,000 pounds in 1909. The production in 1915 was 37,600,000 pounds. Tennessee was the only one of the important copper producing States which failed to show an increase in the output. The production was slightly over 15,000,000, compared with over 18,000,000 pounds in 1915.

**IMPORTS AND EXPORTS.** The imports of all forms of unmanufactured copper for the first 10 months of 1916 amounted to 397,594,000 pounds. This compared with an import of 265,877,000 for the first 10 months of 1915. The imports for the 12 months of 1915 were 315,698,449 pounds. The exports of copper in all forms for the first 10 months of 1916 amounted to 665,472,000 pounds, compared with an export for the first 10 months of 1915 of 529,286,000 pounds. The exports for the 12 months of 1915 were 681,917,000 pounds.

**WORLD'S PRODUCTION.** The greater part of the world's copper is produced by the United States, and consequently belligerent and neutral countries where possible looked to America for their supply. The estimates of world's production compiled by the *Engineering and Mining Journal* for the year 1916 and compared with earlier years are of interest. These statistics were claimed as reasonably accurate for all the countries stated in the table as far down as Russia. From none of the European countries at the end of 1916 were any statistical reports available. Reports from Africa were but partially complete. The Union Minière du Haut Katanga, the largest producer, turned out about 25,000 tons in 1916, against 14,190, in 1915. The production of Russia, Germany, and "other countries" was put at the same figures as in 1915, which in themselves were purely unfounded estimates. These guesses, perhaps permissible in war times, were included in the table in order to arrive at a total, recognizing that even if individually they be enormously in error, the percentage of error in the grand total will be relatively insignificant.

**WORLD'S PRODUCTION OF COPPER (\*)**  
 From *Engineering and Mining Journal*, New York.  
 (In metric tons—2204.6 lbs.)

Country	1913	1914	1915	1916
United States	555,990	525,529	646,212	880,750
Mexico	58,328	86,337	80,969	55,160
Canada	84,880	84,027	47,202	53,268
Cuba	3,881	6,251	8,836	9,311
Australasia	†47,325	37,592†	32,512	35,000
Peru	25,487	23,647	††32,410	††41,825
Chile	39,484	40,876	47,142	66,500
Bolivia	3,658†	1,806†	**3,000	**4,000
Japan	73,152†	72,938‡	‡75,000	‡90,000
Russia	84,816†	81,938†	**16,000	**14,000
Germany	25,808†	30,480†	**35,000	**35,000
Africa	22,870†	24,135†	**27,000	**35,000
Spain and Portugal	54,696*	37,099†	**35,000	**50,000
Other countries	27,158†	25,176†	**25,000	**25,000
<b>Totals</b>	<b>1,005,978</b>	<b>923,888</b>	<b>1,061,288</b>	<b>1,396,609</b>

\* The statistics in this table are compilations of the editors of *Engineering and Mining Journal*, except where specially noted to the contrary. † As reported by Henry R. Merton & Co. ‡ As officially reported. § Privately communicated to *Engineering and Mining Journal* from Japan. \*\* Estimated. †† Communicated by L. Vogelstein & Co.

**BRITISH COPPER TRADE.** As Great Britain was an important consumer of copper for both military and industrial use the government sought to keep down the high prices of the

fixed by the government that it had decided to buy all the necessary copper and zinc and distribute it as seemed best. Naturally the belligerent governments were in the American market for supplies of copper, as for example the Russian government early in September, and a few weeks later was announced the sale of 200,000 long tons for delivery during the first half of 1917 to the French and British governments, a transaction which it may be said would account for about one-third of the total American production in that year.

**COMPARATIVE PRICES.** The importance of copper in the economy of the world under the conditions existing in 1916 best can be appreciated by an examination of the accompanying table of average prices for four years.

See METALLURGY.  
**COPPET, EDWARD J. DE.** See DE COPPET, EDWARD J.

**COPYRIGHT.** Registrations for the fiscal year 1915-16, according to the report of the Register of Copyrights, were 115,967, as compared with 115,193 for the year before. The chief classes were, as before, books, periodicals, musical compositions, prints and pictorial illustrations, and photographs. Renewals numbered 1628 as against 1326 the year before. The applied fees amounted to \$112,986.85. Two amendatory acts were passed by the House of Repre-

**MONTHLY AVERAGE PRICE OF COPPER—1913-16**

Month	New York				London Standard			
	1913	1914	1915	1916	1913	1914	1915	1916
January	16.488	14.223	18.641	24.008	71.741	64.304	60.756	88.088
February	14.971	14.491	14.894	26.440	65.519	65.259	68.494	102.667
March	14.713	14.131	14.787	26.310	65.329	64.276	66.152	107.714
April	15.291	14.211	16.811	27.895	68.111	64.747	75.096	124.319
May	15.436	18.996	18.506	28.625	68.807	63.182	77.600	135.457
June	14.672	18.603	19.477	26.601	67.140	61.336	82.574	112.482
July	14.190	13.223	18.796	23.865	64.166	60.540	76.011	95.119
August	15.400	*	16.941	26.120	69.200	*	68.673	110.383
September	16.328	*	17.502	26.855	73.125	*	68.915	118.905
October	16.337	*	17.686	27.193	73.383	*	72.601	122.750
November	15.182	11.739	18.627	30.625	68.275	53.227	77.744	134.659
December	14.224	12.801	20.133	31.890	65.223	56.841	80.773	145.316
<b>Year</b>	<b>15.269</b>	<b>13.602</b>	<b>17.375</b>	<b>27.202</b>	<b>68.335</b>	<b>61.524</b>	<b>72.532</b>	<b>116.059</b>

New York, cents per pound. London, pounds sterling per long ton of standard copper. \* No quotations.

metal by official interference. In January, 1916, £100 was fixed as the maximum price of electrolytic, although at the time copper was being sold in London for £104. At this time, 60,000 tons were purchased for her munitions makers. In February the ministry of munitions asked purchasers to consult with it before paying £100 for any quantity over 50 tons. On March 1st the government forbade speculation in metals, and the London Exchange at that time was closed four days, after which it reopened under severe restrictions, and it was required that all outstanding contracts for future delivery should be liquidated by May 31st. After this date transactions were only permitted in metals actually on hand and directly with consumers. In December in Great Britain regulations even more drastic were promulgated, requiring all holders of copper to give details of their stocks and metal due under contracts. No transactions or negotiations, except under special license, were to be permitted, and, more important than all, the use of copper was restricted to government work.

**SUPPLIES FOR BELLIGERENTS.** In France on March 1st, manufacturing concerns were noti-

sentatives during the fiscal year. The first—introduced originally by the Chairman of the House Committee on Patents—amended section 28 of the Act of 1909 in such manner as to remove an inconsistency and provide against infringement of copyright "in any work protected under the copyright-laws of the United States," instead of infringement of copyright protected under the Act of 1909 alone, and amended section 30, as follows: The prohibition of the importation of "any piratical copies of any work copyrighted in the United States" was changed to the prohibition of the importation of "any infringing copies, matter or material of any work copyrighted in the United States." The second, introduced on March 30 and referred to the Committee on Patents, proposed to amend section 12 of the Act of 1909 by adding a clause permitting photographs or prints identifying bulky, fragile, or dangerous articles to be submitted accompanied by written or printed descriptions, instead of submitting copies. The fourth Pan-American Copyright Convention, signed at Buenos Aires Aug. 11, 1910, and proclaimed by the United States July 13, 1914, was ratified during the fiscal year by Brazil, Costa Rica, and

Salvador. It had already been ratified by Bolivia, the Dominican Republic, Ecuador, Guatemala, Honduras, Nicaragua, and Panama.

**CORCOBAN ART GALLERY.** See **PAINTING AND SCULPTURE.**

**CORINTH.** See **ARCHÆOLOGY.**

**CORN (MAIZE).** The world's yield of maize in 1916, owing largely to untoward seasonable conditions, was considerably smaller than the yield in the preceding year. The crop of the United States was estimated at over 410,000,000 bushels less than the crop of 1915, and Canada produced only 67 per cent of a normal yield, while the crop in Italy was also reported as poor. The crop harvested in the early months of the year in the southern hemisphere was much smaller than that of the preceding year, and the crop of 1916-17 in Argentina, the principal maize producing country south of the equator, was injured to a marked extent by drouth and locusts. The production in 1916 in the northern hemisphere, according to estimates published by the International Institute of Agriculture, Rome, was 3,364,862,440 bushels, an estimate based to the extent of 85.6 per cent on reports published by countries and of 14.4 per cent on the average production for the five years 1909-13. This production compares with 3,709,939,460 bushels in 1915, representing only 90.7 per cent of it, but is only .6 per cent under the average for the five years 1909-13. In these estimates the following countries which are of considerable importance in corn production, but for which no recent data are available, are not included: Greece, Portugal, Serbia, Turkey in Europe and Asia, Costa Rica, Cuba, Guatemala, Mexico, China, British India, and Morocco. The yield of these countries is roughly estimated at about 433,400,000 bushels, and including this figure, the production of the northern hemisphere amounts to 3,798,262,440 bushels.

The total consumption of the northern hemisphere in 1916-17, excluding the countries just mentioned, is estimated at 3,792,447,000 bushels, and of the southern hemisphere in 1916 at 99,355,160 bushels, making a total world's consumption of 3,891,790,160 bushels, including 40,865,680 bushels required for seed. The world's stock carried over from the preceding crop, estimated at 251,732,820 bushels, added to the 1916 production gives a supply of 3,616,595,260 bushels, or a deficiency, as compared with the requirements for the year, of 275,194,900 bushels.

The average spot price per bushel for the six months April to September, 1916, for Mixed No. 2 at Chicago was 81.7 cents and for American Mixed at Liverpool 142.3 cents, while Yellow Maize at Buenos Aires brought 49.9 cents and Yellow Plate at Liverpool 147.6 cents. Maximum prices were fixed by law in Hungary and Italy and in many countries, both belligerent and neutral, exportation was either absolutely prohibited or greatly restricted. Ocean freight rates were about the same as for wheat, which forms the usual basis of calculation. The average rate from New York to Liverpool for the six months April to September, 1916, was 30.6 cents per bushel and from the River Plate to the United Kingdom, 96.2 cents. These figures compare respectively with about 4 cents and 6 cents per bushel before the outbreak of the European war.

The crop of 1916 in the United States as estimated by the Department of Agriculture, amounted to 2,583,241,000 bushels, produced on 105,954,000 acres, the average yield per acre being 24.4 bushels. As compared with 1915 this was a reduction of 411,552,000 bushels in yield, 243,000 acres in area, and 3.8 bushels in the average per acre. The production was also less than the average for the five years 1910-14. The average farm value on Dec. 1, 1916, was 88.9 cents per bushel, the highest on record, and on this basis the total value of the crop was \$2,295,783,000, which was also unprecedented and greater by \$573,103,000 than the value of the record crop of 1915. The State of Iowa led in production with a yield of 366,825,000 bushels, the average yield per acre being 36.5 bushels. The States ranking next and their yields were as follows: Illinois, 306,800,000; Nebraska, 192,400,000; Indiana, 174,658,000; Missouri, 132,112,000; Texas, 131,100,000; and Ohio, 115,762,000 bushels. In acreage, Illinois ranked first with 10,400,000 acres, followed by Iowa with 10,050,000 acres, these being the only States with 10,000,000 acres or more. The New England States, excepting Rhode Island, continued to report high average yields per acre, the range being from 42 bushels in Massachusetts to 46 bushels in New Hampshire. In Kansas, one of the leading States as a rule, an unfavorable season reduced the average yield to 10 bushels per acre, the lowest for any State.

Since Dec. 1, 1916, when the new Grain Standards act went into effect, only licensed inspectors have authority to inspect and grade shelled corn for interstate and foreign shipment and to issue grade certificates for the same. The standards for shelled corn were changed to take effect Dec. 1, 1916, to the extent that the addition of a test weight for grades No. 1 and No. 2 for all colors of corn is required and that the use of one testing screen with round holes  $\frac{1}{64}$  of an inch in diameter is substituted for the use of the two screens, one  $\frac{1}{64}$  and the other  $\frac{1}{8}$  of an inch in diameter.

**CORNELL UNIVERSITY.** A non-sectarian educational institution at Ithaca, N. Y., founded in 1865. On Nov. 1, 1916, the total number of students, excluding duplicates, was 5264. The total number of different students in 1915-16 was 7143, of whom 5656 were regularly enrolled—4922 men and 734 women. The faculty numbered 684, not including 136 in the Medical College in New York. In February, Morse Hall, the chemistry building, was destroyed by fire, with a loss of \$325,000. Mr. George F. Baker of New York gave \$350,000 to construct three dormitory buildings (grouped in an open quadrangle). The group, known as Baker Court, was completed in 1916. A new Drill Hall costing \$350,000 was to be ready for use in 1917. From anonymous donors \$80,100 was received for a dining hall and Mrs. Dean Sage gave \$50,000 for scientific research. James Morgan Hart, emeritus professor of English literature, and Howard D. Hess, professor of machine design, died in 1916. The following members of the faculty resigned: Frank Irvine, Beverly T. Galloway, Alvin S. Johnson, and George S. Moler. Professor Irving T. Church retired, and Lieutenant Bull, U. S. A., professor of military science and tactics, was ordered to Fort Leavenworth. The following new appoint-

ments were made: Edwin H. Woodruff, dean of law; Oliver Leroy McCaskell, professor in law school; Herbert J. Davenport, economics; Robert M. Ogden, education; Capt. Charles F. Thompson, military science; Dr. Lewis A. Connor, medicine; Dr. Clifford T. Fitch, bacteriology. In June membership in the university faculty was conferred on the adviser of women.

The lecturer for 1916 on the Jacob H. Schiff Foundation for the Promotion of German Culture was Prof. Moritz J. Bonn, of Munich, whose subjects were "International Economics" and "Modern Social Legislation." On the Goldwin Smith Foundation the lecturer was ex-President Taft, who spoke on "International Relations and Duties of the United States" and "The Presidency." Within the last year a radical departure in the government of the university was made by the addition of "professorial trustees." Three members of the faculty were chosen to sit in this capacity. See UNIVERSITIES AND COLLEGES.

Cornell has an endowment of about \$10,000,000 and receives besides annual State appropriations for the Colleges of Agriculture and Veterinary Medicine. The productive funds in 1916 amounted to about \$15,055,000 and the total income to about \$3,225,000. The library contains 474,000 volumes. President, Jacob Gould Schurman.

**CORNWELL, JOHN J.** Elected Democratic Governor of West Virginia, Nov. 7, 1916.

**CORPORATION, AMERICAN INTERNATIONAL.** See FINANCIAL REVIEW.

**CORPORATIONS.** See TAXATION; TRUSTS.

**CORPORATION TAX.** See TAXATION.

**CORRECTION.** For matters connected with this subject, see CHARITIES.

**CORRUPT PRACTICES ACT.** See ELECTORAL REFORM.

**CORTHELL, ELMER LAWRENCE.** An American civil engineer, died at Albany, N. Y., May 10, 1916. He was born in 1840 at South Abington (now Whitman), Mass. He left Brown University to enlist in the Union army for the Civil War, throughout which he served, rising to be captain of a battery. Afterward he returned to Brown, graduated in 1867, and took up civil engineering in Providence. He was connected with railway surveys and construction in Illinois and Missouri, and with the building of important bridges over the Ohio, Missouri, and Mississippi rivers, being chief engineer of the bridges over the Mississippi at Hannibal and Louisiana, Mo., the latter of which had the longest draw of any constructed to that time, and of the Merchants' Bridge at St. Louis. The bridge which he built over the Ohio at Cairo for the Illinois Central was the longest steel bridge in the world. With James B. Eads, Mr. CortHELL was engaged for four years after 1875 in the construction of the Mississippi jetties; after 1880 he brought the West Shore and Ontario and Western railroads down to a point opposite New York City on the Hudson, and constructed their terminal. Other important works with which he was identified were the harbor works at Tampico, Mexico, the Cape Cod Ship Canal, of which he was chief engineer for 11 years, and the New York State Barge Canal. In 1900-02 he served as consulting engineer in the employ of the Argentine government. Mr. CortHELL wrote vari-

ous books and articles, and, gaining an international reputation, received honors at home and abroad, including office in various engineering societies.

**COSTA RICA.** A Central American republic situated between Nicaragua and Panama and bordering the Caribbean on the east and the Pacific on the west. The capital is San José.

**AREA, POPULATION, ETC.** The estimated area is 48,410 square kilometers (18,691 square miles). The estimated population at the end of 1915 was 427,255 (as compared with 399,424 in 1912), distributed in seven provinces, as follows: Alajuela, 101,105; Cartago, 64,294; Guanacaste, 40,414; Heredia, 45,470; Limón, 23,903; Puntarenas, 21,982; San José, 130,087. The city of San José has about 35,000 inhabitants; Cartago, 8500; Heredia, 8200; Limón, 7000; Puntarenas, 5000; Liberia, 2500. The white population dwells principally in these towns. In 1914, marriages, 2178; births, 18,633; deaths, 9482; immigration, 8955; emigration, 8908.

Elementary instruction is free and nominally compulsory. In 1914 there were 428 elementary schools, with 1381 teachers, 34,624 pupils, and an average attendance of 30,599. There are a few institutions for secondary and for professional education. Religious liberty prevails, but the state religion is Roman Catholicism.

**PRODUCTION AND COMMERCE.** Costa Rica enjoys considerable economic prosperity, due to its agricultural progress and its comparative freedom from political unrest. The leading crops commercially are coffee, bananas, sugar cane, and cacao; other crops, of local importance, are corn, beans, potatoes, and rice. Cattle raising is a profitable industry, especially in the west and in the districts adjoining Nicaragua. In 1915, cattle numbered 337,061; horses, about 60,000. Valuable cabinet woods abound in the forests. Gold, silver, and manganese are mined.

Imports and exports have been valued as follows, in thousands of colones:

	1911	1912	1913	1914	1915
Imports	19,080	21,676	18,678	16,240	9,632
Exports	19,192	21,428	22,197	23,859	21,444

Expressed in thousands of American dollars imports and exports in 1912 were 10,188 and 10,071; in 1913, 8778 and 10,433; in 1914, 7633 and 10,979; in 1915, 4527 and 10,079. Leading imports in 1914 and 1915 respectively, in thousands of colones: Cotton goods, 1721 and 1004; wheat, 788 and 718; flour, 407 and 483; lard, 441 and 310; drugs, 353 and 249; rice, 345 and 234; coal, 538 and 230; electrical material, 375 and 205; railway material, 519 and 134. The principal exports have been valued as follows, in thousands of colones:

	1912	1913	1914	1915
Bananas	7,624	11,171	10,168	9,522
Coffee	10,648	7,753	10,029	8,022
Gold and silver bars	1,625	1,828	1,911	1,738
Cacao	183	226	182	376
Hides and skins	251	286	256	544
Rubber	201	96	26	106
Woods	265	304	266	106



Trade by countries, in thousands of dollars:

	Imports		Exports	
	1914	1915	1914	1915
United States .....	4,065	3,065	4,946	4,917
United Kingdom .....	1,100	555	5,248	4,486
France .....	304	85	125	64
Germany .....	1,077	43	477	18
<b>Total, including others.</b>	<b>7,633</b>	<b>4,527</b>	<b>10,979</b>	<b>10,079</b>

The chief port is Limón, on the Caribbean; second in importance, Puntarenas, on the Pacific.

**COMMUNICATIONS.** The length of railway in operation, as reported by the Pan American Union in 1916, is 693 kilometers (431 miles), including branches and sidings, all of 3-foot 6-inch gauge. Of the total, a length of 134 kilometers (83 miles) is the property of the government, 225 kilometers (140 miles) belong to the Northern Railway Co., and 334 kilometers (208 miles) to the Costa Rica Railway. As the Costa Rica Railway is leased to the Northern, the whole system of 559 kilometers (347 miles) is under one general management. Both of these roads are well constructed and are maintained in good condition. Branch lines have been extended up and down the coast for the service of the banana industry. The main line runs from Limón to San José, a distance of 166 kilometers (103 miles). The Pacific Railway extends from San José to the port of Puntarenas, 111 kilometers (69 miles). Terminal facilities at Limón are excellent; at Puntarenas, the harbor has only 15 feet of water at low tide. Telegraphs, 2467 kilometers (1533 miles), with about 135 offices; 2 radiotelegraph stations, one at Limón and one at Colorado, at the east coast near the Nicaraguan border. Post offices, 208.

**FINANCE.** The standard of value is gold. The monetary unit is the colon; its par value is 46.536 cents. Revenue and expenditure have been as follows, in thousands of colones:

	1911	1912	1913	1914	1915
Revenue .....	9,707	9,951	9,618	8,602	6,384
Expend. ....	9,802	9,311	10,184	9,747	....

The decrease in revenue in 1915 was due to the decrease in imports, as the greater part of the revenue is normally derived from customs. The budget, as voted by the Congress for 1916, showed estimated revenue and expenditure of 7,563,000 and 7,759,200 colones respectively. Principal items of estimated revenue: customs, 3,500,000 colones; liquor taxes, 2,200,000; Pacific Railway, 772,000; posts and telegraphs, 400,000. The 1917 budget, as submitted to the Congress, showed an estimated revenue of 7,485,000 and an estimated expenditure of 8,977,460 colones. Public debt, as reported for Dec. 31, 1915, 41,280,757 colones.

**GOVERNMENT.** The executive authority is vested in a president, elected for four years and ineligible for the next term. He is assisted by a cabinet of six members, appointed by and responsible to him. There is no vice-president, but three *designados*, first, second, and third, are chosen by the Congress to succeed to the executive power in case of the president's death or disability. The legislative power is exercised by the unicameral Constitutional Congress, composed of 43 deputies elected

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for four years. The President in 1916 was Alfredo González Flores, inaugurated May 8, 1914, in succession to Ricardo Jiménez.

Costa Rica brought an action in March against Nicaragua for the violation of her rights under the canal treaty with the United States and the Central American Court of Justice on May 5th handed down a decision in her favor.

**COST OF LIVING.** See FOOD AND NUTRITION; PRICES.

**COTTON.** The cotton crop of 1916 was slightly larger than that of 1915. In Dec. 11, 1916, the Bureau of Crop Estimates of the United States Department of Agriculture estimated the crop of 1916 at 11,511,000 bales of 500 pounds each, exclusive of linters. This estimate places the crop 2,668,231 bales, or 18 per cent, below the five-year average (1909-14). The acreage planted in 1916 is reported as having been 35,994,000 acres, an increase of 3,887,000 acres over the area planted in 1915, when the yield was 11,191,820 bales. A number of causes have been mentioned as contributing to the reduced yield, among them, a late spring, drought in some parts of the cotton belt and severe storms in others, ravages of the cotton boll weevil, and lack of potash as a fertilizer. The price of cotton on Dec. 1, 1916, was 19.6 cents per pound, and with the prevailing high prices paid for linters and seed, it is quite probable that the total value of the crop of 1916 will exceed that of any previous cotton crop. On account of high prices, the marketing of cotton is proceeding rapidly, the Bureau of the Census reporting 11,045,225 running bales ginned to Jan. 1, 1917. This total includes 188,052 round bales, which are estimated as half bales, and 113,359 bales of Sea Island cotton. The Sea Island cotton production by States was: Florida, 35,664; Georgia, 74,760; and South Carolina, 2935 bales. A preliminary estimate of the crop of the United States made by the International Institute of Agriculture at Rome, on Nov. 20, 1916, reduced to 500-pound bales, was 11,556,000 bales. Members of the New York Cotton Exchange estimate the crop at 11,429,000 bales. Data regarding the 1916 crop in other countries are rather meagre. United States Consular Reports and others estimate the crop of Egypt at 1,089,213 bales, nearly two-thirds of which is the variety Sakellaridis, and of India at about 3,200,000 bales. The Russian crop is estimated at 1,750,000 bales, while that of Turkey is very small by reason of the war. In Brazil, the crop is reported to have suffered from a prolonged drought, and the production is expected to be lower than usual.

The cotton crop of the United States for 1915, the estimated crop for 1915, and the amount ginned to Jan. 1, 1917, exclusive of linters, by States, were:

States	Crop, 1915 500 pound bales	Estimated crop, 1916 500 pound bales	Reported ginned, Jan. 1, 1917 Running bales
United States ...	11,191,820	11,511,000	1,045,225
Alabama .....	1,020,829	525,000	540,820
Arkansas .....	816,002	1,145,000	1,060,708
California .....	25,551	60,000	28,237
Florida .....	47,831	48,000	50,355
Georgia .....	1,908,673	1,845,000	1,811,266
Louisiana .....	341,063	440,000	436,337
Mississippi .....	953,965	800,000	777,213
Missouri .....	47,999	62,000	55,727

States	Crop, 1915	Estimated	Reported
	500 pound bales	500 pound bales	ginned, Jan. 1, 1917 Running bales
North Carolina..	699,494	646,000	642,824
Oklahoma .....	639,626	835,000	798,963
South Carolina..	1,133,919	920,000	922,080
Tennessee .....	303,420	378,000	357,114
Texas .....	3,227,480	3,775,000	3,526,106
Virginia .....	15,809	29,000	26,192
All other States..	7,149	8,000	11,283

Of the States listed as all others, Arizona, New Mexico, Kansas, and Kentucky contributed to the total crop. Arizona is expected to market a crop of 4000 bales of Egyptian cotton besides a small quantity of Durango cotton grown near Yuma. About one-third of the California crop is Durango, a long staple upland cotton of high productivity.

The cotton crop of the United States for 1915, as finally reported by the Bureau of the Census, was 11,191,820 gross bales of 500 pounds each and 930,469 bales of linters. Of the total crop, 101,844 bales were Sea Island cotton produced as follows: Florida, 28,094; Georgia, 57,572, and South Carolina, 6178 bales. In addition to the lint marketed, there was crushed for oil and meal 4,201,059 tons of seed. The value of the entire crop to the producers was \$794,000,000 divided as follows: Lint, \$628,000,000; and seed, \$166,000,000. The exports of cotton from the United States for the year ending July 31, 1916, are reported to have been 6,191,110 bales. The imports for the same period were 437,572 bales, of which Egypt furnished 350,795; Peru, 10,909; China, 35,748; and other countries, 40,120 bales.

The world's production of commercial cotton, exclusive of linters, grown in 1915, was approximately 18,650,000 bales, according to the Bureau of the Census. Shepperson claims that the world's production for 1915 was 20,823,000 bales. The contributions of the leading countries to the mill supply of the world for 1914 and 1915, based upon data from the above sources, were:

Country	1915	1914
	500 pound bales	500 pound bales
Total .....	20,823,000	24,764,000
United States .....	12,122,000	15,438,000
India .....	3,056,000	8,826,000
Egypt .....	920,000	1,384,000
China (including Korea) .....	2,500,000	1,750,000
Russia .....	1,465,000	1,126,000
Brazil .....	275,000	440,000
Mexico .....	60,000	125,000
Peru .....	121,000	103,000
Persia .....	130,000	127,000
Turkey .....	45,000	120,000
All other countries .....	129,000	825,000

The world's consumption of cotton for the year ending July 31, 1916, was approximately 21,011,000 bales of 500 pounds net. Of this amount mills in the United States took 7,279,361 bales, those in the Northern States consuming 2,870,085 bales and those in the Cotton States, 3,527,528 bales. The total number of active and idle spindles in the world is said to be 148,500,000, of which an average of 32,000,000 have been active in the United States during the past year. In addition to the cotton consumed by the mills, the United States required during the year 880,916 bales of linters; France, 525,000 bales; and Italy, 30,000

bales, chiefly for the manufacture of high explosives.

An attempt has been made to take a census of cotton in China, and an area of 4,580,000 acres, with a production of 435,000 bales, is reported. These figures are considered much too low, and based on the known mill consumption and exports, the cotton crop of China is believed to be nearly 2,500,000 bales. The possibilities of India in the production of cotton have been frequently pointed out. The International Committee of Indian Cotton Spinners is reported to be organizing a company, and the government has placed at its disposal for experimental purposes 750,000 acres of land. At least 500,000 acres of land suited to cotton culture has recently been brought under irrigation in the Punjab. A cotton specialist has been employed by the Indian government to conduct experiments in various provinces on cotton breeding, culture, etc. In Egypt the area devoted to cotton has been still further reduced and the pink boll worm ravages have materially lessened the crop. The production of cotton under the auspices of the British Cotton Growing Association has not increased in the past year to any degree, owing to disturbed conditions resulting from the war. The Uganda crop for 1916 is estimated at 40,000 bales. The area planted in Nyassaland was considerably increased, but the crop was expected to fall below the average. The attempt to grow Egyptian cotton in Nyassaland has been abandoned and attention is now given to upland varieties. Efforts to develop a cotton industry in the Gold Coast Colony resulted in a failure and the project has been abandoned. The total amount of British-produced cotton for 1915, India and Egypt excepted, is reported as 78,589 bales. The grant of £10,000 annually made to the British Cotton Growing Association expired March 31, 1916, and it was renewed for £1000 for 1916-17 only. A West Indian Cotton Conference was held at St. Kitts, March 13 to 18, 1916. From reports, it appears that 36,220 bales of 500 pounds each of Sea Island cotton were exported from the West Indies in 1915. In addition, St. Vincent shipped 850 bales of Marie Galante, a perennial cotton produced on that island to some extent. Great injury was done to the cotton crop of the West Indies by the hurricane of Oct. 7 to 10, 1916. A Cotton Growers' Association has been formed by the planters of the British West Indies. A Cotton Congress was held at Rio de Janeiro, Brazil, May 1 to 10, 1916, under the auspices of the National Society of Agriculture, the object of which was to develop the cotton industry in that country. The crop of 1916 in Brazil was below the average, and to June 20, 1916, American cotton in excess of 30,000 bales had been imported to keep the mills employed. There are said to be 250 mills with 1,464,000 spindles in active operation in Brazil. The Minister of Agriculture of Argentina has put in operation a plan for developing cotton culture through the establishment of colonies, the unit for which is about 24,000 acres of land. Free seed, expert advice, and freedom from taxes are assured for a definite period. A cooperative experiment in cotton growing in 1915, with some 300 farmers in Queensland, resulted in failure so far as extending the industry in that country is concerned.

The United States Department of Agriculture and the experiment stations in the Cotton States continue investigations for the improvement of the crop. The Bureau of Crop Estimates reports that the estimate of the 1915 crop was less than one-third of 1 per cent below the actual yield, as shown by the ginning returns to the Bureau of the Census. Spinning tests of Arizona-grown Egyptian cotton have been made which showed that this type, after bleaching, dyeing, and mercerizing, was practically equal to Sea Island, while both the Arizona-grown Egyptian and Sea Island were superior to Sakellaridis. The cooperative experiments carried on by the department and the experiment stations for the production of cotton resistant to wilt, are progressing in a satisfactory manner, and some strains have been obtained that are quite early and very productive.

The cotton boll weevil, which is an important factor in cotton production in the United States, advanced to an extent only equaled by that of 1915. A favorable winter and large infestations early in the season are responsible for the wide spread in 1916, when the northern limits of cotton production in Oklahoma and Arkansas were reached, Georgia and Florida crossed to the ocean, while, according to late information, the South Carolina boundary line was nearly reached. The total area infested in 1916 was 480,940 square miles, a gain of 71,700 square miles over the previous year. The pink boll worm (*Gelechia gossypiella*) was determined by the specialists of the United States Department of Agriculture as being established in the Laguna district of Coahuila, Mexico, the most important cotton-growing district of that country. The knowledge of the presence of this serious pest within 200 miles of the Texas border resulted in amendments to the quarantine regulations regarding the shipment from Mexico of cotton, cotton seed, etc., in order to prevent, if possible, its entrance into this country. The importation of cotton seed and hulls is prohibited, and the lint can only be brought by water transportation through certain specified northern ports.

The Office of Markets of the United States Department of Agriculture is giving attention to problems connected with the handling and marketing of cotton, cotton warehouses, standardization, and the enforcement of the Cotton Futures Act, which was reenacted by Congress at its last session. The work on cotton standards has been continued, and on Jan. 28, 1916, the Secretary of Agriculture promulgated standards for stained and tinged American cotton. Tentative standards for Arizona-Egyptian cotton have been prepared, and studies have been begun on the possibility of the standardization of Sea Island cotton. The official cotton standards for white American cotton have been adopted by nearly all important markets, 633 full sets having been issued to June 30, 1916. Nineteen of the sets were sent to foreign countries. An examination of some of the earlier sets showed the colors bleached to some extent, indicating the necessity of occasional inspection.

**COTTON SUBSTITUTES.** See CHEMISTRY, INDUSTRIAL.

**COUNTY AGENTS.** See AGRICULTURAL EXTENSION WORK.

**COURT TENNIS.** See RACQUETS.

**COWS.** See DAIRYING.

**COX, GEORGE BARNESDALE.** An American political leader, died May 20, 1916, in Cincinnati, Ohio. He was born in the same city in 1852, and his name had always been identified with politics there. After various employments in youth, he became part owner in a saloon, and by 1885 he had become leader of a Republican organization, later popularly known as "The Gang," which for more than 20 years was in absolute control in Cincinnati. Cox was called the "Easy Boss" and the "Honest Boss," but while he saw to it that minor graft was not allowed, it was testified in court that his graft collections annually amounted to \$7,000,000. In his own party he had powerful enemies, including Charles P. Taft and William H. Taft, both of whom lived in Cincinnati, and by 1906 the public sentiment against bossism had become so intense that Cox found it desirable to announce his retirement from politics. During his period of control he was uniformly successful, except on the one occasion that he himself ran for office—county clerk—when he was decisively beaten, though the rest of the Republican ticket was successful. As president of the Cincinnati Trust Company, and through his large interest in the Shubert theatrical enterprises, as well as by his political connections, Cox amassed a fortune.

**COX, JAMES M.** Elected Democratic Governor of Ohio, Nov. 7, 1916.

**CREDIT UNIONS.** Beginning with the enactment of the Massachusetts credit union law in 1909 laws of a similar nature have since been enacted in New York, North Carolina, Oregon, Texas, Utah, and Wisconsin. The fundamental purpose of these laws is to make it possible for persons with little individual capital to pool their resources and thus create a group credit where individual credit is practically wanting. (See AGRICULTURAL CREDITS; and LOAN SHARKS.) These laws uniformly require that such unions shall issue stock, and that every member shall be a stockholder. The par value of such stock varies from \$1 to \$5 per share, Utah alone fixing the value by law at \$5. The amount of capital is variable, depending on the membership. The share holders may, as a rule, include persons, firms, corporations, or societies; Utah specifically provides for the admission of cooperative societies and in Massachusetts civic, philanthropic, charitable, and religious organizations, as well as persons, firms, or corporations, have become members. In all of these States credit unions are exempt from taxation, along with savings banks and building and loan associations. The purpose of such exemption is to stimulate thrift. Their dividends are limited in North Carolina to 6 per cent, in Utah to 2 per cent in excess of average interest rates; and in others unlimited. The purpose of dividend limitation is to centre the purposes of such unions not upon profit-making but upon the cultivation of thrift. In Utah and North Carolina credit unions may accept deposits from non-members; in other States only members may make deposits but in view of the small value of shares this is not considered an impediment. The liability of members is limited to their share holdings. In this respect the credit unions differ from the Schultze-Delitzsch unions.

of Germany in which individual liability is unlimited. The powers of such unions include the issuance of shares, the making of loans, and as a rule a considerable variety of other activities. Thus in most States these unions purchase supplies at wholesale; in Massachusetts they purchase bonds and shares of other cooperative organizations; in New York and Oregon they hold shares in and make deposits with other credit unions; and in New York they may purchase securities which are legal investments for savings banks. One of the fundamental principles of all these unions is that the voting is on the basis of membership rather than shares held, that is, one man one vote. During 1915 and 1916 a very large number of such unions were formed among the employees of manufacturing, commercial, and insurance concerns. See COÖPERATION.

**CRETE (CANDIA).** An island in the Mediterranean Sea. Area, 3327 square miles; population (census of April 17, 1911), 344,001. Canea, the capital, has 25,185 inhabitants. The island formed part of the early and later Roman empires, and in 1669 was captured by the Turks; they retained it till 1898, when a semi-independent government was established under a high commissioner by Great Britain, Russia, France, and Italy, subject to the suzerainty of the Sultan of Turkey. At the outbreak of war between Greece and Turkey in October, 1912, Crete was declared a part of the Hellenic kingdom, and the treaty of Bucharest (Aug. 10, 1913) confirmed its status. See GREECE.

**CRICKET.** The European war prevented any cricket matches of importance from being held in Great Britain, the home of the game. The annual matches between Oxford and Cambridge universities and Eton and Harrow were among those called off. The Metropolitan League title went to the Brooklyn Club with 10 victories, 3 defeats, and 2 drawn games. Manhattan, the winner in 1915, finished second with 10 victories, 4 defeats, and 1 drawn game.

The New York and New Jersey Association honors were captured by the Staten Island Club, Bensonhurst being second and the Bensonhurst Rovers third. B. Kortlang of the Richmond County Club won the batting laurels while the bowling trophy was taken by M. R. Cobb of the Staten Island Club.

The Germantown Club of Philadelphia for the second year in succession, captured the Halifax cup, winning 5 games, losing 1, and drawing 1. The New York cricketers were second with 4 victories, 2 defeats, and 2 draws.

**CRILE, GEORGE W.** See PSYCHOLOGY, *Emotion*.

**CRIMINOLOGY.** See PENOLOGY.

**CRITICISM, LITERARY.** See articles on French, German, Italian, Russian, Scandinavian, and Spanish Literatures; also LITERATURE, ENGLISH AND AMERICAN.

**CROATIA AND SLAVONIA.** The southwestern portion of the Hungarian Kingdom, not included in "Hungary proper." It has a certain degree of autonomy. See AUSTRIA-HUNGARY.

**CROPS.** See article AGRICULTURE, and section *Agriculture* under various countries and States of the United States.

**CROSS, CHARLES F.** See CHEMISTRY, *INDUSTRIAL, Medals*.

**CROSS COUNTRY RUNNING AND MARATHONS.** Villar Kyronen of the Millrose A. A. was crowned king of cross country runners in 1916. He won the championship title from a large field in the race held over the Van Cortlandt Park course, New York City. Kyronen's time was 32 minutes, 46 seconds. Hannes Kolehmainen, unattached, the 1915 champion, finished second, and John W. Overton, of Yale University, third. The junior cross country title was won by James Henigan of the Dorchester Club, Boston.

Cornell University captured the intercollegiate championship in a race at New Haven, Conn., Yale finishing second and Syracuse University third. The University of Maine, winner in 1915, had to be content with fourth place, trailing Harvard. The individual honors went to John W. Overton of Yale, with L. H. Carroll of Michigan second.

Arthur V. Roth of the Dorchester Club, Boston, won the American Marathon (25 miles), held under the auspices of the Boston Athletic Association, his time being 2 hours, 27 minutes, 16½ seconds. The All-Western Marathon went to Sidney Hatch of the Illinois A. C. Villar Kyronen of the Millrose A. A., New York, was the victor in the *Evening Mail* Modified Marathon through the streets of New York City (12 miles, 1320 yards). His time was 1 hour, 9 minutes, 10 seconds. Sidney Hatch of the Illinois A. C., ran from Milwaukee, Wis., to Chicago, Ill., a distance of 96.4 miles, in 14 hours, 50 minutes, 30 seconds. See ATHLETICS.

**CROTHERS, RACHEL.** See DRAMA.

**CRUISERS.** See BATTLESHIPS; NAVAL PROGRESS.

**CUBA.** A republic in the West Indies consisting chiefly of the Island of Cuba. The capital is Havana (*Sp. Habana*).

**AREA AND POPULATION.** The area has been estimated at 44,164 square miles, but a more recent statement places it at 44,215 square miles. The following table shows the area as estimated by provinces and the population, according to the census of Sept. 30, 1907, and the calculation of Dec. 31, 1914:

	Square miles	Population	
		1907	1914
Pinar del Río	5,212	240,872	257,781
Havana	3,174	538,010	651,266
Matanzas	3,260	239,812	270,513
Santa Clara	3,266	457,481	569,416
Camagüey	10,078	118,260	154,567
Oriente	14,227	455,088	567,988
Total	44,215	2,048,980	2,471,531

About seven-tenths of the population is white, and nearly three-tenths colored. In 1907, native whites numbered 1,224,539; foreign whites, 203,637; colored, 620,804 (of whom, 274,272 negroes, 334,695 mulattoes, 11,837 Chinese). In 1913, births and deaths were 62,098 and 33,284 respectively; in 1914, 85,317 and 35,887. Immigrants in 1914, 25,911 (of whom, 20,140 Spaniards); in 1915, 32,796. Of the latter number, 24,501 were Spaniards, 2453 Hattians, 1834 Jamaicans, 910 North Americans, 840 Porto Ricans, 714 Mexicans, and 319 British. Married immigrants in 1915 numbered 8906; unmarried, 23,890; those under 14 years of age, 2275; females, 6319. Their money averaged \$19 each. The larger cities of Cuba, with pop-

ulation according to the 1907 census, are: Havana, 297,159 (the population has increased considerably since 1907); Santiago de Cuba, 45,470; Matanzas, 36,009; Cienfuegos, 26,616; Cárdenas, 24,280.

**EDUCATION.** According to the 1907 census, about 31 per cent of the population could not read. Elementary instruction is by law free and compulsory. As reported for June 30, 1915, there were in Cuba 2686 public school houses, with 4931 teachers, an enrollment of 289,692 pupils (149,013 boys, 140,679 girls), and an average attendance of 183,947. The government maintains a secondary school in each of the six provinces; total students in 1916, about 2000. There is a state university at Havana, with three faculties—liberal arts and science, medicine and pharmacy, and law; number of students in 1916, about 1400.

**PRODUCTION AND COMMERCE.** The staple crops are sugar cane and tobacco. Other products are cereals, potatoes and other vegetables, cacao, and fruits, especially pineapples, bananas, oranges, and coconuts. The cultivation of tobacco is most important in Pinar del Rio and makes possible the large industry of cigar and cigarette manufacture. Cuba's tobacco production is not so large as that of some other countries, but it excels all others in the output of material suitable for fine cigars. The country's prosperity is due principally to the enormous production of cane sugar, in which Cuba now leads the world. British India ranks second, but a comparison between the two is hardly significant on account of India's immensely greater area. The Cuban sugar output of 1916 was the largest on record, being 3,007,915 metric tons, as compared with 2,592,667 tons in 1915.

A record sugar output was made in 1873, with about 775,000 metric tons. This quantity was not attained again until 1891, when the output was 819,760 tons. The 1,000,000-ton mark was passed in both 1894 and 1895; then came the war of independence, and in 1896 the output was only 225,221 tons. There was no remarkable increase in production until 1901, with 635,856 tons. Since that year there has been rapid and continuous increase except in 1908, 1911, and 1915. The following table shows for various years Cuba's sugar production in metric tons, the average price in cents per pound, and the total value:

	Tons	Price	Value
1885	681,967	3.08	\$42,892,861
1890	632,368	3.06	43,345,031
1894	1,054,214	2.68	62,105,853
1895	1,004,264	2.02	45,440,932
1896	225,221	2.52	13,066,421
1899	385,668	2.47	18,571,839
1900	800,073	2.83	19,022,227
1901	635,856	2.29	30,182,727
1903	998,873	1.96	43,515,495
1904	1,040,328	2.61	60,815,889
1905	1,163,258	2.79	72,698,971
1907	1,427,673	2.28	71,315,212
1908	961,958	2.56	55,162,519
1909	1,513,562	2.52	85,487,545
1910	1,804,349	2.73	109,985,375
1911	1,483,451	3.02	100,852,486
1912	1,895,984	2.61	110,846,807
1913	2,428,537	1.95	106,078,496
1914	2,597,732	2.64	153,619,479

Cattle raising is an important industry. Number of cattle reported Dec. 31, 1914, 3,394,934; horses, 673,439; mules, 50,023; asses, 2709.

The country has large mineral resources, especially in Oriente, including iron, of which there are immense deposits, manganese, copper, lead, zinc, gold, potash, and salt. The principal minerals worked are copper, manganese, and especially iron. In 1916 large deposits of high-grade potash were reported from Santa Clara.

In the calendar year 1915, imports and exports were valued at \$155,448,233 and \$254,291,763 respectively, as compared with \$119,001,410 and \$177,553,954 in 1914. In the fiscal year 1915, imports and exports were valued at \$128,132,090 and \$219,447,322 respectively, as compared with \$134,008,138 and \$170,796,851 in the fiscal year 1914. The course of the Cuban foreign trade in fiscal years may be seen in the following figures, representing thousands of dollars:

	1910	1911	1912	1913	1914	1915
Imports—	163,446	108,098	120,229	135,810	134,008	128,132
Exports—	144,089	129,179	146,787	165,208	170,797	219,447

The leading imports include breadstuffs, meats, cotton goods, iron and steel, and machinery. Principal export values reported for the fiscal years 1913 and 1914 respectively, in thousands of dollars: raw sugar, 110,857 and 119,743; unmanufactured tobacco, 21,650 and 19,007; manufactured tobacco, 13,914 and 13,775; iron ore, 4238 and 3397; cattle hides, 2383 and 2530; molasses, 1977 and 2429; pineapples, 1318 and 1287; bananas, 817 and 1027; copper ore, 599 and 866; spirits, 665 and 532.

Trade with the great commercial countries, in thousands of dollars:

	Imports		Exports	
	1914	1915	1914	1915
United States	69,805	104,723	148,264	206,164
United Kingdom	12,879	15,288	15,842	33,038
France	4,732	5,197	2,898	1,185
Germany	5,084	800	2,854	0
Total incl. others	119,001	155,448	177,554	254,292

**COMMUNICATIONS.** Wagon roads open to traffic total upwards of 1000 miles, mostly in poor condition. Railway is in operation almost from one end of the island to the other, with connections with the principal towns and seaports. There are four lines, aggregating in 1915 1783 miles; in addition, private railways serving the large sugar estates have a combined length of about 500 miles. A decree was signed on November 16th by the President of the republic granting the Compañia del Ferrocarril del Norte de Vuelta Abajo a subsidy of \$6000 per kilometer (\$9660 per mile) for the construction of a railway between the city of Pinar del Rio and the port of Esperanza on the north coast, with a connecting branch to La Palma. Telegraph offices in 1915, 226; government radiotelegraph stations, 9; post offices, 658.

**FINANCE.** The standard of value is gold. Under a law of Nov. 7, 1914, a new coinage was introduced Dec. 1, 1915, the monetary unit being the gold peso, equivalent to the American dollar. American coinage continues to be a legal tender. For the fiscal year 1916 the budget showed estimated revenue and expenditure of \$41,828,580 and \$40,262,906 respectively. This

budget was continued for the fiscal year 1917. Principal estimated receipts: customs, \$29,100,000; excise, \$3,600,000; lottery, \$3,200,000. Larger estimated disbursements: interior department, \$11,044,249; public instruction, \$5,196,421; public works, \$5,101,666; public debt, \$4,457,963; sanitary service, \$4,261,888. Public debt Jan. 1, 1914, \$67,828,000, of which the foreign debt was \$57,420,000.

**GOVERNMENT.** The executive authority is vested in a president, who, with a vice-president, is elected by indirect vote for four years. The President is not eligible for more than two consecutive terms. He is assisted by a cabinet of eight members, whom he appoints. The legislative power is exercised by a congress of two chambers, the Senate and the House of Representatives. Senators (24 in number, 4 from each province) are elected by indirect vote for eight years; representatives (91) are elected by direct vote for four years. The President in 1916 was Gen. Mario García Menocal, who was inaugurated May 20, 1913, in succession to Gen. José Miguel Gómez. Vice-president, Enrique José Varona.

**HISTORY.** On January 17th, Gen. Mario G. Menocal was renominated for the presidency at the convention of the Conservatives and Gen. Emilio Numez for the vice-presidency. An effort was made to prevent the reelection of President Menocal by passing in the Senate on June 15th, a law which required the resignation of the President sixty days before election. This law, known as the Maza bill, failed, however, in the House, the Liberals falling short of a quorum by one vote, the Conservatives having refused to be present. The Maza bill was vetoed by President Menocal, on July 6th. Congress adjourned without appropriating the \$100,000 required for the monument to the American sailors who lost their lives in the battleship *Maine*. President Menocal and his ministers accordingly diverted to the purpose certain unused appropriations, and made arrangements for the erection of the monument at once. It was to be put up in a small park opposite the Santa Clara battery, and to have a total height of 68 feet. Flags of the United States and Cuba were to be placed at either side. A strike of the cartmen occurred in Havana in the summer and was estimated to have cost \$100,000. The company concerned conceded the point at issue and the strike came to an end on July 21st. The Liberal candidate, Dr. Alfredo Zayas, was supported by ex-President Gomez. On November 5th it was announced that on the election which was held on November 1st, President Menocal, the Conservative candidate, had been reelected, after a close vote. The Liberals, however, disputed the result; a bitter contest followed, and at the close of the year, the situation was reported to be serious. Owing largely to the high price of sugar, prosperous conditions prevailed. The cane crop had increased, and the price per pound of raw sugar was one cent higher than in 1915. Foreign trade figures for 1915 published towards the end of 1916 showed an increase of nearly 40 per cent of total imports and exports during the year.

**CULBERSON, CHARLES A.** Reelected Democratic United States Senator from Texas, Nov. 7, 1916.

**CUMBERLAND PRESBYTERIAN CHURCH.** The work of this denomination in

1916 made steady progress. Owing to litigation the denominational publishing house in Nashville was surrendered in 1913 to the Presbyterian Church in the United States, but in 1916 the board of publication announced the purchase of a new publishing plant and machinery. The *Cumberland Presbyterian*, the denomination's weekly journal, is successfully maintained, and also the publication of the Sunday school periodicals and literature. The board of missions reported a disappointing showing owing largely to the fact that so many presbyteries and synods have organized their own boards of missions, or at least some kind of home mission work restricted within local limits, thus causing a considerable loss to the income of the board of missions for the whole Church. The Sunday school committee's report was highly satisfactory. A larger number of Young People's Societies were organized than in 1915. The board of education reported satisfactory work for 1916. Forty students had been aided in the denominational colleges and in preparation for missionary work. According to the latest available statistics the denomination, including the Cumberland Presbyterian Church (colored), has about 1100 ministers, 1600 churches, and 80,000 communicants.

**CUBAÇAO.** A Dutch West Indian colony, 436 square miles, composed of the islands of Curaçao (212 square miles), Bonaire (Buen Ayre), Aruba, St. Eustatius, and Saba, and part of the Island of St. Martin. Total population, Dec. 31, 1910, 54,469 (24,297 males, 30,172 females); Dec. 31, 1913, 55,183. Export of phosphate in 1911: Curaçao, 3028 cubic meters; Aruba, 27,658 (in 1912, 28,392). Raw gold export in 1912 (Aruba) was valued at 84,561 guilders. Total imports, 3,890,123 guilders; exports, 2,425,541. Vessels entered 1912, 1428 of 2,713,000 cubic meters' capacity at Curaçao, and 1745 of 184,000 at ports of other islands.

**CURRENCY.** See BANKS AND BANKING; COINS, VALUE OF; FINANCIAL REVIEW.

**CURTAIN FIRE.** See MILITARY PROGRESS.

**CURZON, GEORGE NATHANIEL,** first Earl. A British statesman, appointed President of the Council in Lloyd George's cabinet, formed in December, 1916; also a member of the War Council and government leader in the House of Lords. He served as Lord Privy Seal in the Asquith Coalition cabinet, formed in November, 1915. Lord Curzon gained his great reputation as Viceroy and Governor General of India (1899-1905). See GREAT BRITAIN.

**CUSHING, ERNEST WATSON.** An American surgeon, died in Boston Aug. 27, 1916. Born in Boston in 1847, he graduated from Harvard at the age of 20 and three years later at the College of Physicians and Surgeons, New York. From 1874 he practiced in his native city, where he founded the Cushing Hospital and helped to found the Woman's Charity Club Hospital, later known as the Massachusetts Woman's Hospital, of which he was surgeon for 20 years. From 1895 to 1913 Dr. Cushing held the chair of abdominal surgery and gynecology in Tufts Medical School. Tufts gave him the honorary degree of LL.D. in 1898. For 16 years (1887-1903) he edited the *Annals of Gynecology and Pediatrics*. He was one of the earliest demonstrators of the tubercle bacillus.

**CYCLING.** Frank L. Kramer in 1916 won the professional sprint championship for the

fifteenth successive year. He scored a total of 28 points during the season, gathering 5 first places and 1 second. Robert E. Spears of Australia was Kramer's most dangerous rival, with 1 first, 1 second, and 3 thirds for a total of 14 points. The professional paced title went to Clarence Carmen with George Wiley second and Leon Didier third. John L. Staehle won the amateur honors with 28 points, William Spencer being second with 10 points.

Three new records were made in 1916 by R. J. McNamara, who rode a mile in handicap in 1 minute, 45 seconds; 10 miles in 20 minutes, 7½ seconds; and 15 miles in 31 minutes, 28½ seconds.

The annual six-day race held in Madison Square Garden, New York City, was won by the team of Egg and Dupuy, who scored 49 points, the distance traveled being 2624 miles, 4 laps. The other teams to finish in order were: Root and Madden, Spears and McNamara, Kaiser and Cameron, Hill and Drobach, and Walthour and De Baetes.

**CYCLONES.** See FLOODS.

**CYPRUS.** An island in the Mediterranean, annexed in November, 1914, by Great Britain. Area, 3584 square miles; population (1911), 274,108. Estimated population at the end of 1913, about 287,000. Nicosia, the capital, had, in 1911, 16,052 inhabitants. Elementary schools of all classes, in 1914, 610 (414 Christian, 196 Mohammedan), with 739 teachers and an enrollment of 33,805 (27,685 Christians and 6120 Mohammedans). Cereals, carebs, the famous Cyprus wine, cheese, fruit, vegetables, and live stock are exported. In 1913 there were about 67,700 horses, mules, and asses; 60,500 cattle; 265,500 sheep; 255,200 goats; and 37,000 swine. The imports in 1914 were valued, exclusive of specie, at £496,744 (from Great Britain £146,359); the exports at £496,776 (to Great Britain, £162,615). In virtue of proclamations dated March 20, April 3, and May 12, 1916, the export of wheat and barley with their products is prohibited to all destinations; the export of corn, oats, and oatmeal to all destinations other than the United Kingdom, British possessions and protectorates is also prohibited. The export of corn, meal, rice, and rye (with their products) to all foreign countries in Europe and on the Mediterranean and Black seas, other than France, Russia (except through Baltic ports), Italy, Spain, and Portugal, and that of linseed with the further exception of Spain and Portugal, is prohibited. Shipping entered and cleared (1914), £581,926 tons. Revenue (1914-15), £290,110; expenditure, £316,414. A sum of £92,800 was payable annually to Turkey, but this is appropriated to the interest on the guaranteed loan of 1855.

**CYRENAICA.** See LIBYA.

**CYTOLOGY.** See ZOOLOGY, *Cytology*.

**CZERNOWITZ.** See WAR OF THE NATIONS.

**DAHOMÉY.** A French West African colony, one of the component parts of the government-general of French West Africa (q.v.). A recent estimate of population is 910,902. Capital, Porto Novo, with 40,000 inhabitants. Principal products for export are palm kernels, palm oil, dried fish, live animals, copra, cotton, etc.

**DAIRYING.** PROGRESS IN THE UNITED STATES. On January 1, 1915, there were 21,988,000 milch cows in the United States, as compared with 21,262,000 a year earlier. The

milk yield in 1915 is estimated at 11,590,000,000 gallons. The average wholesale price of milk per gallon for the whole United States during 1916, exclusive of December, was 21.24 cents, and during 1915, 20.93 cents. The retail price for the first 11 months in 1916 averaged 29.3 cents per gallon and in 1915 28.23 cents. Census data published during the year show a production in 1914 of 786,013,489 pounds of butter, valued at \$223,179,254; 377,506,109 pounds of cheese, valued at \$50,931,925; and 884,646,761 pounds of condensed milk, valued at \$59,374,946.

In the agricultural extension work of the United States Department of Agriculture in co-operation with the State colleges of agriculture, rapid strides were made during the year in building up the dairy industry in the cotton belt, especially in the cattle-tick-free areas and boll-weevil infested districts. In this region dairy extension work consisted in the main of assistance in the establishment of cow-testing, bull, and other live stock associations; the keeping of private herd records; the building of silos, barns, and dairy houses; the purchase of cattle; the establishment of coöperative creameries and cheese factories; and the improvement of the milk supply of cities. In the West dairy extension work has been along similar lines, but in other parts of the United States, owing to the advanced condition of the dairy industry, work was concentrated upon the development and supervision of organizations which will benefit communities. On October 1st there were in the United States 346 coöperative cow-testing associations with 8886 members and 150,677 cows; and 32 pure-bred bull associations with 650 members who owned 141 bulls and about 6000 cows.

The increased cost of milk production has resulted in demands on the part of producers for higher prices for market milk. The milk dealers in many cases have complied with these demands and have in some cases promptly passed the increase along to the consumers. In other cases there has been severe contest, resulting in strikes on the part of milk producers and attempts to dispose of their milk direct to the consumers, eliminating the contractors and handlers. A plan proposed to eliminate some of the uneconomic features of the present method of delivering milk to consumers in cities is the establishment of municipal distribution. This plan has received widespread agitation during the year. See STRIKES.

The meeting of the National Dairy Show at Springfield, Mass., in October, was the first to be held in the East, all former meetings of the National having been held in Chicago. The exhibit of about 890 head of pure-bred dairy cattle was said to be the largest number of cattle ever brought together in one show. Attendance records for the National were also broken.

Investigations by the United States Dairy Division show that it is feasible to cool hot-bottled milk by forced air under commercial conditions. The Indiana Experiment Station found that when milk is pasteurized at 145° F., holding process, there is no development of cooked flavor and no interference with the rapidity of cream rising. The Dairy Division found small-top pails, clean udders, and sterile utensils to be important factors in securing low bacteria counts in milk. Work at the Illinois Experi-

ment Station showed that dairy utensils and temperature during transportation are the important sources of high bacteria counts in market milk. High bacteria counts in clarified milk as compared with those of milk before clarification were shown by the Iowa Experiment Station to be due to the breaking up of clumps of bacteria during centrifuging. Bacteriologists at the New York Geneva Experiment Station advocate the counting of bacteria in milk by the microscope method. They claim that the plate method reveals only the number of clumps of bacteria present. The Dairy Division demonstrated that the various sediment tests for dirt do not give a clue as to the kind or number of bacteria contained in milk.

In investigating the development of undesirable flavors in cold storage butter the Dairy Division found that this is not due to oxidation of the fat in butter, but to chemical changes resulting from the slow oxidation of non-fatty substances in the buttermilk contained in the butter. The extent of this chemical change is directly proportional to the amount of acidity in the cream from which the butter is made. The Dairy Division has perfected a method of making and ripening cheese of the Roquefort type, and has isolated the bacterium producing the eyes in Swiss or Emmental cheese. These results make it practically certain that these cheeses, which supply the bulk of our cheese imports, can be successfully made in this country.

Nutrition investigations at several of the State experiment stations are having an important bearing on the feeding of dairy cattle. Studies on the mineral metabolism of the milch cow at the Ohio Experiment Station have demonstrated that special attention should be given to the calcium, magnesium, and phosphorous contents of rations of heavily-producing cows in order that the loss of these elements from the skeleton may be kept as low as possible. Especially is a liberal supply of foods which are rich in these elements necessary for cows in the latter part of lactation, in order to refund previous overdrafts before the birth of the next calf. The Missouri Experiment Station has found that the milking functions of the cow when mature are not appreciably affected by the amount of feed nutrients supplied during growth. It has also shown that the tendency of cows which are abundantly fed is to produce normal milk. Investigations at the Wisconsin Experiment Station are having an important bearing upon the compounding of rations, as it has been shown that proteins from different sources differ materially in their ability to produce milk and growth.

DAIRYING IN FOREIGN COUNTRIES. Statistics published during the year show that the number of dairy cows and heifers in England and Wales has increased from an average 1,952,648 in 1881-85 to 2,484,220 in 1914. The estimated milk production for these two countries in 1915 is placed at 1,070,000,000 gallons. During the year ended June 30, 1916, the total imports of butter of the United Kingdom were 148,351 tons, of which about 26,000 tons were from British possessions. The cheese imports for the year were 127,246 tons, of which 102,904 tons came from British possessions. The war has seriously affected Italy's dairy industry. The government has limited the exportation of

cheese, but most Italian cheeses retain their quality for a long time and they have been stored to avoid flooding the market.

The census taken in Switzerland, April 19, 1916, shows an increase of 11.9 per cent in the number of cattle in five years, including 6.5 per cent increase in the number of cows. Owing to increased exports of cheese and condensed milk, and the increased use of cheese as a substitute for meat in the Swiss army, the dairy industry has been very profitable during the year in spite of the high cost of feed. Denmark's exports of butter increased from 95,300 tons in 1914 to 101,600 tons in 1915, and cheese from 500 tons in 1914 to 4300 tons in 1915. The exportation of cream had practically ceased in 1915. It is estimated that 77 per cent of the milk produced in Denmark is handled through coöperative dairies. Statistics published during the year show that, due to systematic selection and feeding, the average annual milk production per cow in Denmark has increased from 3000 pounds to almost 6000 pounds in the last 30 years.

Canada exported during the year 1915, 160,659,808 pounds of cheese, besides trans-shipping a considerable foreign trade in American cheese. During the year ended Aug. 31, 1916, New Zealand exported 40,772,200 pounds of butter and 97,379,100 pounds of cheese.

On account of the scarcity and high price of rennet efforts are being made to discover ways of limiting its use in cheese making. Experiments at the Finch and Guelph experiment stations in Canada show that pepsin of good quality or a mixture of pepsin and rennet can be successfully used in cheese making. At the Hoorn Experiment Station in Holland, Edam cheese was successfully made by the use of one-half the usual amount of rennet and adding 40 c.c. of hydrochloric acid per 100 litres of milk. Equally successful was the use of one-fourth the normal amount of rennet and the addition of 40 gm. of water-free calcium chlorid per 100 litres of milk. Pepsin was found to be a satisfactory substitute for rennet. Experiments in Sweden demonstrate that a pasteurization temperature of 145° F. for from 20 to 30 minutes does not affect the taste of the milk, the rising of the cream, or the composition of the protein and soluble phosphates. Pasteurizing milk at 149° F. seriously affected it in all these points.

DAIRY RECORDS. The following are some of the high production records made in 1916: The 4-year-old Holstein heifer, Queen Piebe Mercedes, finished a year's test with a production of 30,230 pounds of milk and 1111 pounds of fat. This is said to be the only heifer in the world with 30,000 pounds of milk to her credit. The Red Poll cow, Muria, produced in one year 14,972 pounds of milk containing 884 pounds of fat, which is said to be a record for this breed.

LITERATURE. The following is a list of some of the important dairy literature of the year: S. H. Ayers, J. T. Bowen, and W. T. Johnson, "Cooling Hot-bottled Pasteurized Milk by Forced Air," in *United States Department of Agriculture Bulletin* 420 (Washington, 1916); R. S. Breed and J. D. Brew, "Counting Bacteria by Means of the Microscope," in *New York State Experiment Station Technical Bulletin* 49 (Geneva, N. Y., 1916); H. C. Campbell,



"Comparison of the Bacterial Count of Milk with the Sediment or Dirt Test," in *United States Department of Agriculture Bulletin* 361 (Washington, 1916); Janet E. Lane Clayton, *Milk and Its Hygienic Relations* (London, 1916); D. C. Dyer, "Progressive Oxidation of Cold-Storage Butter," in *Journal of Agricultural Research* (Washington, Sept. 11, 1916); E. B. Forbes, F. M. Beegle, et al., "The Mineral Metabolism of Milch Cows," in *Ohio Experiment Station Bulletin* 295 (Columbus, Ohio, 1916); C. H. Eckles and L. S. Palmer, "The Influence of the Plane of Nutrition of the Cow upon the Composition and Properties of the Milk and Butter Fat: Influence of Overfeeding," in *Missouri Experiment Station Research Bulletin* 24 (Columbia, Mo., 1916); W. Fleischmann, *Lehrbuch der milchwirtschaft* (5th ed., rev., Berlin, 1915); B. H. Hibbard and A. Hobson, "The Marketing of Wisconsin Butter," in *Wisconsin Experiment Station Bulletin* 270 (Madison, Wis., 1916); C. H. Kilbourne, *The Pasteurization of Milk from a Practical Viewpoint* (New York, 1916); C. W. Larson, *Milk Production Cost Accounts* (New York, 1916); H. S. Reed and R. R. Reynolds, "The Effect of Temperature on the Growth and Activity of Bacteria in Milk," in *Virginia Experiment Station Technical Bulletin* 10 (Blacksburg, Va., 1916).

**DAKIN'S SOLUTION.** An antiseptic liquid produced by the action of sodium carbonate on a solution of chlorinated lime; the resulting fluid, after being siphoned off from the precipitate of calcium carbonate and filtered, is neutralized with boric acid. Chlorinated lime and Labarraque's solution (chlorinated soda) are well known disinfectants, the difference between the latter and Dakin's solution being the addition of boric acid, for the purpose of neutralization. This solution has been used for irrigating wounds and rendering them aseptic, in French military hospitals during 1915-17.

Dakin (Dr. H. D. Dakin, director of the Herter Laboratories in New York, but now serving as bacteriologist in France) disclaims originality for the antiseptic, which was discovered by Berthollet in 1788. The antiseptic value of hypochlorous acid has been attributed to its ready decomposition in the presence of organic matter with the liberation of oxygen. Dakin, however, believes that its antiseptic action is due, not to the liberation of oxygen, but to the formation of chloroamide groups in the protein, and that these in time may give rise to the antiseptic action. In either case, according to the modern conceptions of the liberation of electrons, the reaction would be interpreted as one of oxidation. It is generally held that all results justify the conclusion that hypochlorites whether applied in acid, alkaline, or neutral solutions, are of great value in the treatment of infected wounds.

Stimson, of New York, gives the exact formula and directions as he received them from Dr. Alexis Carrel, of New York, at Campiagne. He states that all the wounds treated with the solution at this place looked healthy and clean, while those observed in some other places were brown and unhealthy, due in all probability to faulty preparation and the persistence of alkalinity. The formula is as follows: Chlorinated lime (bleaching powder) 200 gm.; sodium carbonate, dry, 100 gm.; sodium bicar-

bonate, 80 gm. Put the chlorinated lime (2) in a 12-litre flask with five litres of ordinary water, and let stand over night. Dissolve the sodium carbonate and bicarbonate (3) in five litres of cold water. Pour (3) in the flask containing (2), shake it vigorously for a minute, and let stand to permit the calcium carbonate to settle. After half an hour siphon off the clear liquid and filter it through paper. The resultant is perfectly limpid. It must be kept protected from the light. The antiseptic solution is then ready for surgical use. It contains about 0.5 gm. per cent of sodium hypochlorite with small amounts of neutral soda salts, and is practically isotonic with blood serum. See SURGERY.

**DAMS.** The construction of dams and reservoirs by the United States Reclamation Service by the end of 1916 had reached a point where the dams of masonry, earth, and rock fill had totaled a volume of 12,300,000 cubic yards, and included four of the highest dams in the world. The reservoirs thus formed would contain sufficient water to cover the States of New Jersey and Delaware to a depth of 12 inches. Indeed in the United States practically every variety of dam known to engineering practice has been constructed and in many instances in dimensions far in excess of those built in other countries.

**FEDERAL LEGISLATION.** Legislation to permit the construction of power dams in navigable streams by private companies again figured in the United States Congress in 1916, and the general Dam bill providing for a system of leases under government regulation and designed to induce private investment in water power development, was passed by the House of Representatives on July 14th. Later in the summer conferees of the Senate and House of Representatives endeavored to reconcile differences in their respective measures but were unable to come to any agreement.

**THE ELEPHANT BUTTE DAM,** on the Rio Grande River, about 14 miles west of Engle, N. M., and the main structure in the Rio Grande project of the United States Reclamation Service, was completed on May 13, 1916. The dam, progress on which has been noted in the YEAR BOOKS for 1911, 1913, 1914, and 1915, is of rubble concrete with a gravity section and straight plan. It is 1200 feet long, at the roadway surface, 203.5 feet high above the original river surface, and 304.5 feet from deepest excavation to top of parapet wall. The maximum width at base is 215 feet and the roadway top is 16 feet. It contains 550,000 cubic yards of masonry. A reservoir is created 45 miles long and with 42,000 acre area, containing when full 115,098 million cubic feet.

The Elephant Butte Dam was formally dedicated October 19th, under the auspices of the International Irrigation Congress, which was in session at El Paso, the rain having caused the postponement of the ceremonies from October 14th. The principal address was made by A. A. Jones, First Assistant Secretary of the Interior, who was present as the personal representative of President Wilson. A. P. Davis, director and chief engineer of the United States Reclamation Service, discussed the engineering phases of the dam, the question of the reservoir filling with silt, and some of the different remedies therefor. E. H. Baldwin, construction engineer

of the dam, and later senior engineer and project manager of the Rio Grande project, also made a short address covering the operations during construction.

It might be said that an investigation of the silting probabilities based on the probable inflow of silt into the reservoir area of 2,638,860 acre-feet indicated a service life of 233 years according to estimates made by R. R. Coghlan and V. E. Lieb.

**YADKIN RIVER DAM.** After 15 years of development and exploitation, the hydro-electric project with the great Yadkin Narrows Dam near Stanley, N. C., was nearing completion in 1916. The dam under construction is of solid concrete 1400 feet in length, and 217 feet in height, and contains 525,000 cubic yards of concrete or slightly less in amount than the Elephant Butte Dam described above, thus being one of the largest concrete dams in the world. It was the highest overfall type dam up to 1916 and was built in vertical blocks of about 50-foot width measured on the upstream face. The dam is of gravity section curved, with a radius of 1678 feet and the weight of the cyclopean concrete employed is unusually great, being 162.5 pounds per cubic foot, due in large measure to the high specific gravity of the porphyry aggregate. Except for 450 feet of wing on the west end and 100 feet at the east end the overfall section occupies the entire length. The Yadkin Narrows Dam was of interest as it is the final result of a series of developments planned for this district where it was proposed to establish a large aluminium industry. Previous to 1907 a long low cut stone dam costing about a half million dollars was built across the river but was abandoned when a French concern, the Southern Aluminium Company, entered the field with a project for a curved non-overflow gravity section concrete dam 1350 feet in length and a maximum height of 200 feet, forming a reservoir of about 8 square miles area. The outlets for flood overflow were through a couple of 60-foot wells and tunnels. In 1914 the European war halted the work of the French company and the Tallahassee Power Co., a subsidiary of the Aluminium Company of America, acquired the site and proceeded to modify the plans of the French engineers according to American practice, converting the dam into an overfall section clear across the river and using a spillway bypass channel instead of wells and tunnels. The power house immediately below the dam was built for four 31,000 horse power generating units (see **TURBINES**), three of which were being installed in 1916, these being the largest turbine units ever built. The work of construction was somewhat interfered with by the July floods in North Carolina, but substantial progress was being made. The dam and its construction are fully described in *Engineering Record* for November 18th, and *Engineering News* for November 16th.

**CALAVERAS EARTH DAM.** Work continued during 1916 on the Calaveras Earth Dam (see **YEAR BOOKS** for 1914 and 1915) which, with its 240 feet of height, 3,000,000 cubic feet of fill, was the highest earth dam undertaken. At the end of the year about one-half of the yardage had been deposited by hydraulic method in the great embankment which for volume was second to the Gatun Dam at Panama. The crest length of the dam is 1300 feet

and the base width 1300 feet, the upstream slope being 3:1 and the downstream slope  $2\frac{1}{2}$ :1. The reservoir outlet consists of a concrete culvert 1300 feet long with a cross section of 234 square feet, which follows the original stream channel beneath the dam, and by means of a reinforced concrete tower 225 feet high at its upper end provides an outlet. The direct cost of sluicing the first million cubic yards of fill was about 25 cents per cubic yard, exclusive of overhead expenses. The progress made in 1916 indicated the completion of the dam by 1918. A discussion of the work by G. A. Elliott, engineer in charge, will be found in *Engineering Record*, Aug. 19, 1916.

**NOGUERRA PALARESA RIVER DAM.** During the year a large dam was built across the Noguerra Palareza River in a chasm near the town of Talara, near Barcelona, Spain, from plans by American engineers and under their supervision. This dam, which abuts on almost perpendicular cliffs, was built of concrete, 330 feet in height and 700 feet in length, being 230 feet thick at the base and gradually decreasing to 14 feet at the top. The dam provides an artificial lake  $15\frac{1}{2}$  miles long by  $3\frac{3}{4}$  miles wide, from which water is drawn both for power and irrigation. The natural formation of the rock permitted the construction of a spillway with a capacity of 70,000 cubic feet a second, while there is a canal system which provides for the irrigation of an arid district of nearly 100 square miles. The power plant in 1916 was yielding 20,000 horse power of electric current, and it was to be doubled shortly. In the construction of the dam modern American methods and machinery were extensively employed and the cement used was made from limestone and marl in the neighborhood and transported to the dam site by a temporary railway. The cement-making machinery, stone crushers, mixers, etc., as well as other machinery, including traction engines and cars, were imported from the United States.

**GABLENZ.** In September the newspapers reported the failure of a dam near Gablenz, Bohemia, which resulted in more than 300 deaths and heavy property losses. Several villages were reported inundated and, while no bridges have failed, many were said to be impaired.

The structure that failed was believed by engineers to be one of the old dams built several hundred years ago, as the newer structures in the mountainous districts of Silesia are of excellent design and well constructed. They are used only to safeguard life and property and to make the streams navigable. See **FLOODS**.

**DANBY, FRANK.** An English author, whose real name was Mrs. Julia Frankau, died in London, March 17, 1916. Born in 1864, the daughter of an artist, she was educated at home by Mme. Paul Lafargue, whose father was Karl Marx. At 19 she was married to Arthur Frankau, a merchant. Her early literary work consisted of contributions to the *Saturday Review* and other journals. After writing two novels, Mrs. Frankau, for some years, turned to the study of engraving, publishing in this field *Eighteenth Century Color Prints* (1900), *Life of John Raphael Smith* (1902), and *Lives of James and William Ward* (1904). Among the novels which appeared between 1902 and her death were: *Pigs in Clover*, *Baccarat*, *The Sphinx's Lawyer*, *The Heart of a Child*, *Let*

*the Roof Fall In, Concert Pitch, Full Swing, and Twilight.* In 1910 appeared, in two volumes, *The Story of Emma, Lady Hamilton.*

**DANIELS, JOSEPHUS.** See UNITED STATES.

**DANISH LITERATURE.** See SCANDINAVIAN LITERATURE.

**DANISH WEST INDIES.** A colony of Denmark, made up of three West Indian islands—Saint Croix, 84 square miles; Saint Thomas, 33; and Saint John, 21. Sugar is the principal product for export.

**DARTMOUTH COLLEGE.** A non-sectarian educational institution for men at Hanover, N. H. It was founded in 1769. In the autumn of 1916 the total enrollment was 1494. The faculty numbered 123 and there were 13 officers of administration. Dr. Ernest Fox Nichols, president of the college, resigned his office, and on October 6th Ernest Martin Hopkins, who had been secretary of the institution, was installed as his successor. During the year the following instructors retired: John K. Lord, professor of Latin; James F. Colby, professor of political science; Charles H. Morse, music director. The college received \$75,000 from Wallace F. Robinson of Boston. Productive funds amounting to \$4,184,586 yielded an income of \$166,300. The year's income was \$400,000. In the library are 130,000 volumes.

**DAVIS, HENRY GASSAWAY.** An American capitalist and ex-Senator, died at the home of his daughter, Mrs. Stephen B. Elkins, in Washington, D. C., March 11, 1916. He was born at Woodstock, near Baltimore, Md., in 1823, and after a country-school education went to work on a farm. At 19 he became a brakeman on the Baltimore and Ohio, later conductor, and agent at Piedmont. To develop, with his brothers, the opportunities which he was the first to appreciate, of shipping coal and lumber from the Piedmont region, Mr. Davis resigned his railway connection, and began to buy up large tracts of land in Maryland and West Virginia. Gradually he built several communities, among them Deer Park, Md., and Elkins, W. Va., his summer and winter homes, respectively, and to these towns he gave various buildings. The West Virginia Central and Pittsburgh Railway, sold to the Wabash in 1902, and the Coal and Coke Railway of West Virginia were built by Mr. Davis. His political career began in 1865, when he was elected to the West Virginia House of Delegates; this was followed by a term in the State Senate; and from 1871 to 1883 he served as United States Senator, declining nomination for a third term. Although a Democrat, Mr. Davis gained the support of many Republicans, and held appointments under Republican Presidents, as member of the first and chairman of the second Pan-American Conference, and chairman of the Intercontinental Railway Commission. While in the Senate he served on the Committee on Appropriations and the Committee on Transportation Routes to the Seaboard. At 81 he was nominated by the Democratic National Convention of 1904 for the vice-presidency, to run with Judge Alton B. Parker; despite his age he took an active part in the campaign, both by speeches and writings. At the time of his death he was supposed to be worth about \$30,000,000.

**DAVIS, HORACE** An American educator and manufacturer, died in San Francisco July 13, 1916. Born in Worcester, Mass., in 1831, he

graduated from Harvard in 1849, and then studied law; but after three years he went to San Francisco, where he entered manufacturing. Identifying himself with Republican politics, he served as a representative in Congress from 1877 to 1881, and from 1880 to 1888 as a member of the Republican National Committee. For three years (1887-90) Mr. Davis was president of the University of California. Other educational institutions with which he was connected were Leland Stanford, of which he had been president of the board, and the California School of Mechanic Arts, of which he was president. In religious denominational work also he was prominent, at one time holding the presidency of the National Conference of Unitarian Churches and the vice-presidency of the American Unitarian Association. He wrote on *American Constitutions, The Public Ministry of Jesus, Shakespeare's Sonnets*, etc. The University of California, Harvard, and the University of the Pacific gave him the degree of LL.D.

**DAVIS, JOHN KING.** See POLAR RESEARCH, *Antarctic.*

**DAVIS, RICHARD HARDING.** An American story writer and war correspondent, died at his home, Cross Roads Farm, near Mt. Kisco, Westchester County, N. Y., April 11, 1916. The son of L. Clarke Davis, noted as editor of the Philadelphia *Public Ledger*, and of Rebecca Harding Davis, who for many years was a writer of magazine stories, Mr. Davis was born in Philadelphia April 18, 1864. He was educated at the Episcopal Academy in Philadelphia, at Lehigh University, and at Johns Hopkins. In 1887 he began newspaper work in Philadelphia, on the *Record*; later he was a reporter for the *Press* and the *Telegraph*, in the same city, gaining an early reputation by his account of the Johnstown flood. While in London, as special correspondent with a Philadelphia cricket team, he got material on the Whitechapel murders, which were committed at that time. In 1890 he joined the staff of the *Evening Sun* of New York, of which Arthur Brisbane was then managing editor, and for three years, from 1891, was himself managing editor of *Harper's Weekly*. Soon after coming to New York he gained his first success as a story writer with "Gallagher," recounting the adventures of a "cub" reporter, and one of the best things he ever wrote, which was published in *Scribner's*. Then came the first of the Van Bibber stories, and in 1895 his first long story, *The Princess Aline*.

Mr. Davis did his earliest work as a war correspondent, a field in which he was to take a foremost place among American newspaper men, when he reported for the London *Times* the Græco-Turkish War in 1897. His writing at this time attracted attention in Europe and America. It was the precursor of much similar work, for from then on there was hardly a war or a revolt that Davis was not sent out as correspondent by some paper—the Cuban insurrection, the Spanish-American War, the South African War, the Russo-Japanese War, the Balkan Wars, and the great European war. After the invasion of Belgium by Germany in 1914, he had exciting experiences, and barely escaped with his life. Later on he went to Saloniki and accompanied the French and British armies in their retreat from Serbia, and he had been home only a few weeks before the strain and hardships he had suffered had

their effect, and he died suddenly from angina pectoris. He was an intense partisan of the Allies. At the time of his death he was at work on a new book, *With the French in France and Salonika*.

Richard Harding Davis will probably be remembered longest for his stories of romantic adventure, especially those dealing with political upheavals in Latin America. These represent a counterpart of Anthony Hope's stories, such as *The Prisoner of Zenda*, and at once took popular fancy. The first to be published, *Soldiers of Fortune* (1889), is not only representative of the type, but it is the best known and was best liked by Davis himself. Other titles to be mentioned include: *Captain Macklin* (1902); *The Bar Sinister* (1904); and *Vera the Medium* (1908). Besides these are many collections of stories, volumes relating to his adventures as a correspondent, books for boys, and accounts of travel, some 30 in all. Several of his books were turned into plays or appeared originally as such, among the most successful being *The Dictator* and *The Galloper*. Mr. Davis possessed a remarkable personality that seemed to be a curious incarnation of one of the adventurous, proud, and good-hearted "soldiers of fortune" that he delighted to picture; yet at the same time, his life was one of unremitting labor.

**DAWSON, JACKSON.** See **HORTICULTURE, Necrology.**

**DAYLIGHT SAVING.** In the spring of 1916 there was adopted in Europe generally a change in the ordinary reckoning of time by the arbitrary putting forward of the hands of the clock one hour, so as to secure a readjustment of daily occupations to a period of greater daylight. This was done in April or May and in the following September or October the clocks were put back an hour. The advantages claimed were increased use of daylight in place of artificial illumination and an attempt to approximate the same relative distribution of a person's activities in summer as in winter as regards light and darkness. The plan was in no way novel, having been suggested in France in April, 1784, by Benjamin Franklin in a contribution to the *Journal de Paris*, "Economical Project for Diminishing the Cost of Light." In its modern aspect, however, the Daylight Saving movement may be said to date from the publication of a small work, *The Waste of Daylight*, by William Willett, a British builder, in 1907. The first fruit of this propaganda, which soon was destined to become world wide, was the introduction of a "Daylight Saving" bill into the British Parliament in 1908, but the measure failed of passage and Willett died before the successful issue of the movement was realized. In 1909 and 1911 similar bills failed in Parliament, but the cause was agitated on the Continent and by 1916 it became well rooted. On April 6th, the German Federal council passed a statute providing on May 1st for setting forward the clocks one hour, and this date was so observed. Later in the month, despite the objections of members of the Académie des Sciences, there was passed by the Chamber of Deputies in France the Honnorat bill with the same purpose in view. This measure was advanced by the government as a measure of economy providing for the saving of light and fuel and on this basis was passed without formal op-

position. The House of Commons agreed to "Daylight Saving" as a provisional war measure on May 8th, and on May 20th, at midnight the clocks were duly put forward one hour. On May 1st the clocks in Holland were set ahead, and on May 22nd those in Norway. Austria, Denmark, Sweden, Switzerland, Italy, Spain, Portugal, and Turkey all adopted this new "summer time" and it was accordingly in use until September 30th, when the clocks were put back and standard of Greenwich time resumed. In North America the new scheme was actually introduced in Nova Scotia, and there was an active propaganda in the United States and Canada. Bills were introduced into Congress and associations to further the movement were formed.

In the United States, however, standard time was first developed and by the coöperation of the railways and other agencies an efficient system was adopted. That "Daylight Saving" would break down this system it is impossible to assert, yet it was feared that it might lead to a general overhauling and alteration of some of its fundamental principles. Accordingly at the meeting of the American Railway Association in November, the Committee on Standard Time reported on the Daylight Saving movement and stated that the correct stand for the railroads to maintain was

"1. That the present zone system of dividing time is scientifically correct.

"2. That any change in the sub-division of time would result in endless confusion, and would be disastrous to the railroads.

"3. That in the event of a nation-wide movement to change the hands of the clock in order to readjust the hours of daylight to the hours of labor, the railroads should not antagonize the movement. The railroads will not suffer any very serious inconvenience by the change as proposed, although such a change from a scientific standpoint is not warranted nor is the committee in sympathy with the movement. The railroads should not agree to the 'daylight saving' project until it has been previously adopted by the principal business and municipal centres and the State and local authorities. Unless a change of the character proposed can be made on the same date throughout the country it will lead to great confusion and difficulty."

The report was approved.

**DEATH RATE.** See **VITAL STATISTICS.**

**DE BACA, E. C.** Elected Democratic Governor of New Mexico, Nov. 7, 1916.

**DE COPPET, EDWARD J.** An American banker and patron of music, died in New York April 30, 1916. He was born in New York in 1855 and succeeded to his father's interests in Wall Street, from 1891 being head of the firm of De Coppet and Doremus. His fondness for chamber music, especially for the string quartet, led Mr. De Coppet to have musical organizations play for him at his villa on Lake Geneva in Switzerland, and in 1902 he brought together four musicians who were to devote themselves to perfecting their ensemble for the enjoyment of their patron and his guests. This quartet, called the Flonzaley Quartet, from the name of the De Coppet villa, soon gained such a reputation that they began to give public concerts in New York, on tour in the United States, and in Europe, where they came to be held in the highest esteem. Latterly, Mr. De Coppet had retained

their services but for 12 weeks of the year. The quartet had just played for him one of his favorite compositions, when he died.

**DEDEKIND, J. WILHELM RICHARD.** A German mathematician, died at Brunswick, Germany, Feb. 12, 1916. He was born at Brunswick and studied at the university there and at Göttingen (Ph.D., 1852). After several years as a teacher at Göttingen, he went to the Zurich Polytechnic in 1858 as professor of mathematics, and from 1862 till his death held a chair in the technical school at Brunswick. Professor Dedekind's international reputation brought him membership in the academies of science of Göttingen, Berlin, Paris, Rome, and Zurich. He published *Was sind und was sollen die Zahlen?* (2d ed., 1893), and edited *Vorlesungen über Zahlentheorie* (4th ed., 1894).

**DEFECTIVES.** See CHARITIES; PENOLOGY.

**DEFENSE, NATIONAL.** See NAVAL PROGRESS.

**DELAWARE. POPULATION.** The estimated population of the State at the end of 1916 was 214,270. The population in 1910 was 202,322.

**AGRICULTURE.** The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture in 1915-16 were as follows:

		Acreage	Prod. Bu.	Value
Corn	1916	205,000	6,970,000	\$6,203,000
	1915	210,000	6,615,000	4,101,000
Wheat	1916	124,000	1,860,000	3,013,000
	1915	125,000	1,875,000	2,044,000
Oats	1916	4,000	120,000	74,000
	1915	4,000	184,000	68,000
Potatoes	1916	10,000	900,000	1,125,000
	1915	11,000	1,045,000	784,000
Hay	1916	80,000	116,000	1,844,000
	1915	70,000	84,000	1,428,000
Rye	1916	1,000	15,000	18,000
	1915	1,000	16,000	16,000

a Tons.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments	726	808
Average number of wage earners	21,288	22,155
Capital invested	\$60,906,000	\$69,324,000
Wages	10,296,000	11,382,000
The value of materials used	30,938,000	31,649,000
The value of products	52,840,000	56,085,000

**TRANSPORTATION.** The mileage of the railroads operating in Delaware in 1916 was as follows: Wilmington and Philadelphia Traction Company, 89.25 miles; Wilmington, New Castle, and Delaware City, 15.65 miles; People's Railway Company, 29.88 miles.

**EDUCATION.** The total enrollment in the public schools of the State in 1916 was 32,511. The average daily attendance was 13,179. There were 101 male teachers and 493 female teachers. The average yearly salary of male teachers was \$492.93, and females \$363.34.

**FINANCE.** The latest report of the financial condition of the State is for 1914, when the total receipts amounted to \$685,203, and the disbursements to \$716,653. There was a balance at the beginning of the year of \$45,797, and at the end of the year of \$14,418.

**CHARITIES AND CORRECTIONS.** There was no board supervising charitable and correctional institutions. The Associate Charities of Wilmington has a director in direct supervision over many philanthropic institutions. These include the Home for Friendless Children, the Home for Aged Women, St. Joseph's School for Orphan Colored Boys, the Florence Crittendon Home, the Delaware Industrial School for Girls, Home of Merciful Rest, and the Layton Home for Colored Persons, all at Wilmington. There are in addition several institutions in Dover and Marshalltown, the Delaware Hospital for the Insane at Farnhurst, and the New Castle County Hospital. The Delaware State Tuberculosis Commission has general charge of the work for the prevention and cure of this disease.

**POLITICS AND GOVERNMENT.** The campaign in Delaware in 1916 resulted in several surprises. The greatest of these was the defeat of Henry A. du Pont for reelection to the United States Senate by Josiah Walcott. Thomas W. Miller, son of the Governor, lost his seat in Congress after having filled it for one term. He was succeeded by a Democrat, A. L. Polk. John G. Townsend, nominated by the Republicans and Progressives, was elected, defeating John G. Hughes, and David G. Reinhardt was elected Attorney General by the Republicans and Progressives, defeating Armon D. Chaytor. In the vote for President, Mr. Hughes carried the vote. A fight was made on the Republican organization by Alfred J. du Pont, chiefly against his cousin, D. Coleman du Pont, who led the Republican organization, and who was fighting for Henry A. du Pont and Thomas W. Miller for Congress. A Progressive ticket was named, with Dr. Hiram Burton, former member of Congress, as the nominee for Senator. John G. Townsend for Governor. The Democrats, on the whole, showed gains in the election. In the voting for Governor J. H. Hughes received 24,350 and J. G. Townsend 26,648. For United States Senator, Walcott, Democrat, received 25,416, and du Pont, 22,925. For President, Hughes received 26,011 votes, and Wilson, 24,753. For Attorney General, Reinhardt, Republican, received 25,539, and Chaytor, 25,184. In the Senate were elected 7 Democrats and 10 Republicans, and in the House of Representatives, 8 Democrats and 2 Republicans.

**STATE OFFICERS.** Governor, John G. Townsend, Jr.; Lieutenant-Governor, Lewis E. Eliason; Secretary of State, George H. Hall; Attorney General, David J. Reinhardt; State Treasurer, William J. Swain; Auditor of Accounts, William G. Roe; Commissioner of Insurance and Banking, Thomas R. Wilson; State Librarian, Thomas W. Wilson; Commissioner of Education, Dr. Charles A. Wagner.

**JUDICIARY.** Supreme Court: Chancellor, Charles M. Curtis; Chief Justice, James Pennewill; Associate Justices, William H. Boyce, Henry C. Conrad, Herbert L. Rice, T. B. Heisel; Clerk, Wilbur D. Wilds.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Democrats	7	19	26
Republicans	10	16	26
Majority	3 R	3 D	..

**DELBOS, VICTOR.** See PHILOSOPHY.

**DENMAN, WILLIAM.** See SHIPPING BOARD, UNITED STATES.

**DENMARK.** A constitutional European monarchy, hereditary in the male line of the Schleswig-Holstein-Sonderbourg-Glücksabourg branch of the house of Oldenbourg. It is situated north of Germany, between the North and Baltic seas. Copenhagen is the capital.

**AREA AND POPULATION.** The area and population by insular and mainland divisions, according to the census taken Feb. 1, 1911, compared with the figures for population in 1906, are shown in the following table:

Islands:	Sq. m.	Pop. 1911
Seeland .....	2,895	1,096,897
Bornhojn .....	227	42,885
Lolland-Falster .....	692	115,658
Fyn .....	1,341	303,179
<b>Jutland:</b>		
Southeast Jutland .....	2,827	482,264
Southwest Jutland .....	4,144	364,620
North Jutland .....	2,920	351,573
<b>Total Denmark proper .....</b>	<b>15,046</b>	<b>2,757,076</b>
Faroe Islands .....	540	18,000
<b>Total .....</b>	<b>15,586</b>	<b>2,775,076</b>

The rural population in 1911 numbered 1,647,350, the urban, 1,109,726. Copenhagen (Köbenhavn), covering 28 square miles, had (1911) 462,161 inhabitants; Fredericksberg, 97,237; Aarhus, 61,755; Odense, 42,237; Aalborg, 33,449; Horsens, 23,843; Randers, 22,970; Esbjerg, 18,208; Vejle, 17,261; Fredericia, 14,228; Kolding, 14,219; Helsingör, 13,783; Svendborg, 12,667; Nyköbing, 11,010; Viborg, 10,885; Slagelse, 10,463. Engaged in and dependent upon agricultural occupations (1911) were 1,019,382 persons; in trades, 755,004; commerce, etc., 314,923; transportation, 167,196; etc. Of the total population, 2,655,522 were Danes, and with regard to religion, 2,715,187 were Lutherans.

In 1914 there were 19,757 marriages, 75,022 births, 37,648 deaths (stillbirths included), and 6263 emigrants. Marriages in 1913 numbered 20,460 (20,533 in 1912); living births were 72,465 (74,651); stillbirths, 1734 (1754); and deaths, 35,378 (36,481).

**PRODUCTION.** Agriculture and dairying are the principal industries. About 80 per cent of the total area is productive; less than one-half the productive area is under crop, the remainder being forest, pasture, and meadow. The total cropped area in 1907 was 3,896,870 hectares, divided as follows: 1,122,761 hectares under cereals, 308,362 under roots, 27,247 under industrial plants, 1,229,585 under grasses (including meadows, pastures, and sown forage), 230,413 fallow, 978,502 other (including gardens, parks, etc.).

An English source gives the following figures for area planted to main crops and production in 1915 with comparative figures for production only in 1914:

	1915		1914	
	Acres	Bu.	Bu.	Bu.
Wheat .....	166,292	7,788,000	5,605,981	
Barley .....	651,153	25,091,000	20,137,861	
Oats .....	1,035,850	41,533,250	37,458,212	
Rye .....	526,287	12,597,750	9,578,113	
Potatoes .....	166,407		86,179,000	
Beets .....	698,630		493,790,000	

Dairying is an important industry. Creameries in operation in 1911, 681, with 104,557 work people; the milk employed was from 605,208 cows, with an average production of 2570 kilos of milk per cow. The live stock censuses of July 15, 1909, and July 15, 1914, returned 535,018 horses and 568,240, respectively; cattle, 2,253,982 and 2,462,862 (of which, cows, 1,281,674 and 1,310,268); sheep, 726,879 and 514,918; swine, 1,467,822 and 2,496,661; goats, 40,257 and 40,670; fowls, 11,815,783 and 15,153,999.

The manufactures are chiefly for home consumption, the exports consisting largely of agricultural products. See AGRICULTURAL EXPERIMENT STATIONS; DAIRYING.

**COMMERCE, ETC.** By law dated August 6, 1914, the export of cereals, flour, and fodder has been prohibited since that date. By ministerial order dated October 29, 1914, the export of cotton has been prohibited since the latter date. By ministerial order of December 11, 1914, the export of linseed has been prohibited from that date. As regards goods in transit and transshipment, all such, if of a kind prohibited to be exported from Denmark, are covered by prohibition unless they are on a through bill of lading to a port in a foreign (non-Danish) country. The prohibition is therefore applicable in cases where the goods are either shipped to a Danish port, to order, or where the goods are redesigned to another port than that originally mentioned in the bill of lading. The ministry of justice grants licenses to export certain goods, as above, but such licenses are valid only for one month from date.

The general and special trade is shown below in kroner:

Imports:	1913	1913	1914
General ...	817,512,000	855,351,000	795,288,000
Special ...	740,015,000	777,424,000	717,787,000
<b>Exports:</b>			
General ...	682,082,000	721,290,000	867,446,000
Special ...	596,723,000	637,360,000	780,226,000

A table of principal articles of import and export follows, values in thousands of kroner:

Imports	1000 kr.	Exports	1000 kr.
Cereals .....	86,466	Butter .....	213,018
Oilcake .....	59,835	Meat .....	205,443
Fuel .....	59,833	Animals .....	160,534
Wood .....	38,102	Eggs .....	36,246
Iron mfrs. ....	27,502	Skins .....	18,663
Veg. fibres. ....	24,007	Fish .....	11,720
Iron .....	19,561	Barley .....	11,276
Animals .....	17,842	Ships .....	5,439
Woolens .....	16,975	Iron mfrs. ....	8,451

Germany furnished imports and received exports valued at 264,653 and 301,424 thousand kroner respectively; Great Britain, 145,137 and 431,605; Sweden, 83,097 and 37,960; Russia, 40,490 and 14,006; Netherlands, 22,551 and 2241; Norway, 17,475 and 22,843.

Vessels entered in the 1914 trade, 34,086, of 4,268,099 tons. Merchant marine (Jan. 1, 1914), 4386 vessels, of 566,727 tons.

Railways in operation at end of 1913, 2390 miles (1243 State owned); state telegraph service (1914), 8373 miles; telephone wires, 342,522 miles; post offices, 1171.

**FINANCE.** Revenue and expenditure for comparative years are shown below, in kroner; A—receipts and expenditures current; B—receipts

from investments and funding of debt and expenses for improvements on domains and reduction of debt:

	1912-13	1913-14	1914-15
Rev. A . . . .	114,175,582	123,874,961	121,780,782
Rev. B . . . .	80,342,814	4,209,088	84,894,354
Exp. A . . . .	106,882,288	111,404,448	156,180,163
Exp. B . . . .	83,601,075	12,185,641	16,457,920

The budget for 1916-17 shows revenue A, 132,914,132 kr.; B, 17,829,415; expenditure A, 118,210,978; B, 18,921,755. The debt stood, March 31, 1915, at 392,636,122 kr.

**NAVY.** The fleet, maintained for the purposes of coast defense, is composed of 3 monitors carrying, each, two 9.4-inch and four 6-inch guns, and 1 carrying one 9.4 and three 4.7; 3 torpedo gunboats; 14 first-class torpedo boats; 6 submarines; besides an old battleship, a cruiser, and some small craft. Building: a coast defense vessel and several submarines.

**GOVERNMENT.** Reigning sovereign, Christian Charles Frederick Albert Alexander William, born Sept. 26, 1870; married April 26, 1898, to Alexandrine, Duchess of Mecklenburg (born Dec. 24, 1879); proclaimed king (Christian X) May 15, 1912, upon the death (May 14th) of his father, King Frederick VIII. Heir-apparent, Prince Christian Frederick Francis Michael (born March 11, 1899). The king is the executive, assisted by a ministry of eight members, appointed by him and responsible to the Parliament, or Rigsdag. This body consists of an upper house of 66 and a lower of 114 members. Justice is administered by judges of the hundreds and by city magistrates, from whose courts appeals are taken to the superior courts at Viborg and Copenhagen. In case of impeachment of ministers the Upper House appoints 4 judges to sit with the Supreme Court as a joint tribunal.

**HISTORY.** Upon the signing of the treaty for the sale of the Danish West Indies by Denmark to the United States for \$25,000,000, the Lower House of the Danish Parliament voted in favor of the sale provided upon reference to popular vote it was approved. This action was taken by a vote of 62-44 and the ratification of the treaty was carried by the same vote. In the Upper House on August 15th a committee of 15 members was appointed to consider the sale. On August 24th a resolution was passed that if the purchase could not be deferred till after the close of the war, the question should be decided at the next election. In consequence of the opposition in the Lower House, however, a resolution was passed on September 26th to refer the matter to popular vote. See UNITED STATES, *Foreign Relations*.

On March 21st, M. Hage succeeded M. Brandes as minister of finance and toward the end of April took charge of the department of commerce. At the same time the ministry of cults was divided into the ministry of churches (M. Pousson) and the ministry of public instruction (M. Nielson). On May 15th the daylight saving measure advancing the legal time sixty minutes was passed. On September 27th in joint committee of both houses it was decided to increase the cabinet by three members without portfolios chosen from the Conservatives, Socialists, and Left parties respectively. The appointments were announced on September 30th

as follows: T. H. Stauning (Socialist), M. Rottboell (Conservative), J. S. Christensen, formerly Prime Minister (Left).

**DENTAL SCHOOLS.** See UNIVERSITIES AND COLLEGES.

**DE PAUW UNIVERSITY.** A co-educational institution at Greencastle, Ind., founded in 1837. It is under the control of the Methodist Episcopal Church. In the fall of 1916 there were 928 students and 38 faculty members. The productive funds of the institution amount to \$1,298,068 and the total income for the last year was \$118,322. The library contains about 48,000 volumes. President, George R. Grose.

**DERBY, EDWARD G. V. STANLEY,** seventeenth Earl. See GREAT BRITAIN.

**DESTROYERS.** See BATTLESHIPS AND OTHER WAR VESSELS.

**DESTRUCTORS.** See GARBAGE AND REFUSE DISPOSAL.

**DE THEBES, MADAME.** See THEBES, MADAME DE.

**DEUTSCHLAND.** See NAVAL PROGRESS; SUBMARINES.

**DEVI, RATAN.** See MUSIC, *Artists, Vocalists*.

**DEVONPORT, HUDSON E. K.,** first Baron. See GREAT BRITAIN.

**DEVONSHIRE, VICTOR CHRISTIAN WILLIAM CAVENDISH,** ninth Duke of. A British administrator, whose appointment as Governor-General of Canada was announced June 27, 1916. He was born in 1868, son of Lord Edward Cavendish, and succeeded to his uncle's titles in 1908. The Duke of Devonshire was educated at Eton and at Trinity Hall, Cambridge, and from 1891 till he entered the House of Lords represented West Derbyshire in Parliament as a Liberal Unionist. From 1900 to 1903 he served as treasurer of the royal household, under Queen Victoria and Edward VII, and later he became known as one of the closest friends and advisers of George V. In 1903-05 he held the office of financial secretary to the Treasury and after 1915 that of civil lord of the Admiralty. In 1912 he received the G.C.V.O., and he was also made a Privy Councillor. The Duke of Devonshire came into possession of large estates, and of his half dozen houses several are famous—Devonshire House in London, Chatsworth House in Derbyshire, and Bolton Abbey, Yorkshire. His collections of paintings and sculpture are among the most noted in Great Britain. The appointment of the Duke to succeed the Duke of Connaught as Viceroy in Canada was known to be acceptable to the government and people of the Dominion.

**DEWEY, JOHN.** See PHILOSOPHY.

**DIABETES.** According to modern views this disease is due to functional impairment of the pancreas, causing interference with the metabolism of carbohydrates, so that the amount required to supply the necessary physical energy is not assimilated. Glucose then accumulates in the blood, and when the concentration reaches a certain limit, the excess of glucose is carried off through the kidneys. The latest and most successful dietary system for eliminating sugar from the urine, first advised and used by Dr. Guelpa of Paris, was elaborated by Dr. F. M. Allen, and the treatment is known by Allen's name. According to the *Journal of the American Medical Association*, this treatment may be briefly described as follows: The diabetic who constantly indulges in food in excess of his as-

similative capacity invariably becomes progressively worse; hence the conception has arisen that diabetes is characterized by an inherent downward tendency. As a matter of fact, practically every diabetic has some tolerance for food, and the tolerance is usually sufficient to allow for a great enough food intake to cover the basal energy requirements. With proper treatment, it is possible to maintain or even to increase this tolerance. On the basis of animal experiments and carefully controlled clinical observations, Allen has recently proposed a system for the treatment of diabetes that incorporates those features of the older methods that are of proved value, but introduces, in addition, a number of features, some of which are in direct opposition to the older teachings. This treatment is briefly as follows: 1. A preliminary fast is taken until the urine is free from sugar. 2. Following the fast, carbohydrate food is gradually added, at first in the form of green vegetables. 3. Coincident with the addition of carbohydrates, or in place of it, if the carbohydrate tolerance is very low, protein is added to the diet in small but gradually increasing amounts until glycosuria occurs, or a sufficient amount of protein is taken to cover the basal requirement. 4. Fats are added in small amounts during the time of addition of carbohydrates and protein. Subsequently, a sufficient amount of fat is added to make up fuel requirements of the body, provided this amount can be tolerated without the appearance of glycosuria or acidosis. 5. Frequent urine examinations are made, either by the medical attendant or by the patient himself, and the appearance of glucose is taken as an indication for a fast of sufficient length to cause a cessation of the glycosuria. Feeding is subsequently begun with not more than one-half of the carbohydrate contained in the diet at the time of the appearance of glycosuria. Subsequent carbohydrate increase is made very gradually. 6. At intervals the patient fasts for a day or else takes a greatly restricted diet. 7. Body fat is reduced to a minimum and the adult diabetic is not allowed to gain weight; children may gain, but the gain must not be adipose tissue. 8. Active daily exercise carried to the point of healthy fatigue is advocated.

The object of the preliminary fast is to remove from the body the excess of unassimilated carbohydrates and to allow for a rest of the overtaxed pancreatic function. As a result of the fast, a proportionately larger amount of carbohydrate may be metabolized. This has been definitely proved by calorimetric observations on diabetics. With the removal of the unassimilated excess, the organism is better able to assimilate an amount of carbohydrate which it was previously unable to utilize. During the fast, there is a decreased production of acetoacetic and beta-oxybutyric acids. The length of fast required before the urine becomes sugar-free is usually less than five days; exceptionally, it may be as long as eight or ten days. Water is allowed *ad libitum*, and tea or coffee in moderate amount if desired. No sugar or cream is allowed, though saccharin may be used for sweetening. Clear meat broth may be taken after the second day of fasting. Rarely, whisky may be administered, up to one ounce thrice daily, since it does not increase glycosuria, and in certain cases seems to inhibit the production

of the acetone bodies. Alcohol is not an essential in the treatment, and should not be administered to patients in whom it produces such symptoms as burning in the throat, headache, and nausea. During the fasting period weak patients should be in bed. More vigorous ones should exercise as far as practicable, since by exercise the duration of the fast may be shortened.

**DIAGHILEV, SERGEI.** See MUSIC, *Ballet*.

**DIAMOND.** See MINERALOGY, section so entitled.

**DIARRHEA, WHITE, IN CHICKS.** See VETERINARY MEDICINE.

**DIESEL ENGINES.** See INTERNAL COMBUSTION ENGINES.

**DIET.** See PELLAGRA; KARELL DIET.

**DIETETICS.** See FOOD AND NUTRITION.

**Dieulafoy, Madame Jeanne.** A French explorer, archæologist, and author, died at the Château de Langlade (Haute-Garonne), May 25, 1916. Her maiden name Magre, she was born in Toulouse in 1851, was educated in a convent at Auteuil, and at 18 married Marcel Dieulafoy, an engineer. At the time of the Franco-Prussian War, her husband having volunteered, Mme. Dieulafoy obtained permission to accompany him to the front in a soldier's uniform, and she served throughout the war. Afterward, for some years, the two were constantly associated in travel, literary work, and other interests, and in 1881 she went with him on his first Persian exploration. During this period of arduous researches and excavations in the East, much was accomplished, for they discovered the ruins of the palaces of Darius and Artaxerxes, and brought back to Paris notable examples of ancient art, the most famous being the frieze of "Persian Archers," now in the Louvre. Mme. Dieulafoy, accustomed to wearing a man's clothing, was allowed by the French government to continue to do so after her return to Paris. Her fatal illness was acquired in Morocco, whether she had gone with her husband, who had volunteered for defense service at the outbreak of the European war. In Morocco she discovered the ruins of a twelfth century mosque built by Sultan Yakub. Mme. Dieulafoy wrote on her travels; six romances, five historical, of which one, *Parysatis*, was crowned by the French Academy; and an historical study, *Isabelle la Grande*.

**DIGBY, SIR KENELM EDWARD.** A British lawyer and public official, died at Studland, Dorset, April 21, 1916. He was born in 1836 at Tittlehall, Norfolk. At Harrow and at Christ Church, Oxford, he was noted as an athlete, in rowing and cricket. He was called to the bar at Lincoln's Inn in 1865, became a bencher in 1891, and in 1904 was made King's Counselor. At Oxford he was Vinerian law reader from 1868 to 1874, and from 1892 to 1894 was county judge on the Derbyshire Circuit. Then for eight years he held the office of permanent under secretary of state at the Home Office. In 1898 he received the K.C.B. and in 1906 the G.C.B.

**DIMAZON.** A coal-tar product, having the chemical name Diacetyl-amino-azotoluene, and the formula  $\text{CH}_3\text{C}_6\text{H}_4\text{N}:\text{N}:\text{C}_6\text{H}_4(\text{CH}_3)\text{N}(\text{CH}_3)_2$ , which is said to stimulate the proliferation of epithelial cells. It is applied locally in the form of 2 per cent ointment made with petroleum or dissolved in a fatty oil. It may also be mixed with talcum and used as a dusting powder. It is said to be of value in hastening



the healing of indolent ulcers of all kinds, and in the treatment of burns, wounds, and eczema.

**DIPHTHERIA.** Cats have long been suspected as spreaders of diphtheria among children. Confirmation of this suspicion is given by an outbreak of diphtheria in an orphanage, 69 cases coming from one building. After eliminating such factors as water supply, food, and sanitary defects, the cats in the institution were examined. Cultures of secretions of their throats proved to be swarming with the diphtheria bacillus. After the cats were destroyed only a few more cases occurred, owing to previous infection.

The human diphtheria carrier constitutes the most serious problem in relation to the spread of diphtheria with which sanitarians have now to deal, and many devices have been tried to sterilize the throats of these carriers. Many of these measures have been noticed from time to time in the **INTERNATIONAL YEAR BOOKS**. Antitoxin has no effect on the carrier. Toxin and antitoxin mixtures are also valueless. Vaccines have not proved successful in a sufficient number of cases to make their use reliable.

Martin and Wassermann prepared an antibacillary serum; but this and a serum prepared by the Lister Institute have been failures. Attempts to replace the bacillus of diphtheria by nonpathogenic or comparative harmless organisms have been made in several quarters with some success. Among the organisms employed may be noted the *Staphylococcus pyogenes aureus*, the *Bacillus Bulgaricus*, the various lactic acid bacilli, yeasts, and molds. These are applied locally to the tonsils and throat. Direct treatment by chemical substances has long been in vogue. The drugs commonly employed are iodine, alcohol, carbolic acid, chromic acid, and formaldehyde. The latest substance recommended is kaolin, advocated by Rappaport of Chicago, who uses it after it has been thoroughly dried in an incubator. Rappaport claims 21 per cent of successes in 100 cases of diphtheria carriers in 10 days, 50 per cent in 20 days, 90 per cent in 30 days. In young children the powder is blown into the nose by means of a rubber bulb attached to a glass tube. Six treatments at two-hour intervals during the day are advised. In older persons the powder is best applied to the pharynx, by having the patient swallow it, in four half-teaspoonful doses at two-hour intervals, six times during the day. Kaolin acts by adsorption, taking up the bacilli with which it comes in contact. Its action is purely mechanical and not bactericidal.

Ruh, Miller, and Perkins advocate the removal of the tonsils of a diphtheria carrier as the best means at our command of sterilizing the throat. They declare that the reaction after the operation is no greater than in ordinary cases and that the disappearance of the bacillus follows closely the fading of the pseudo-membrane which forms after the operation. Attempts have been made to increase the activity of the white blood corpuscles in diphtheria carriers. For this purpose normal serum suspensions of leukocytes and several drugs such as calcium chlorid, magnesium chlorid, and lactic acid, while successful in promoting phagocytosis in the laboratory, did not seem to stimulate these bodies in the human subject to attack the diphtheria bacilli, these being found outside the leukocytes.

**DIRECT PRIMARY.** See **ELECTORAL REFORM.**

**DIRIGIBLE BALLOONS.** See **AERONAUTICS.**

**DISASTERS.** See **FIRE PROTECTION; FLOODS; NAVAL PROGRESS; SAFETY AT SEA.**

**DISCIPLES OF CHRIST.** The total membership of this denomination, variously known as Disciples of Christ, or Churches of Christ, or the Christian Church, and including both the conservative and radical elements, embraced in the year 1916 about 11,182 churches, 1,337,450 members, and 8424 ministers. The strength of this denomination lies largely in the Ohio-Mississippi Valley States. It is one of, if not the leading communion of Christians in the States of Kentucky, Indiana, and Missouri; Illinois, Iowa, Kansas, Nebraska, and Texas are largely represented also. In 1916 the sum of \$2,057,442.41 was raised for missionary work.

Without doubt the most significant feature of the work is known as the Men and Millions Movement. This was an enterprise inaugurated three years ago and has a comprehensive three-fold purpose. First, to secure a fund of \$6,300,000 by individual gifts to equip the mission stations at home and abroad and to substantially increase the endowment of the educational and benevolent institutions. Second, to enlist 1000 choice volunteers for the mission field and to inspire tens of thousands of young people to consecrate their lives to definite Christian service, wherever the Spirit of God shall direct. Third, to establish in every church in the brotherhood the every-member canvass as the best plan for securing from every member of the church an offering upon the first day of the week for the support of the local church and the extension of the Kingdom in all the world.

This proposed fund of \$6,300,000 is to be over and above the regular income of the eight missionary boards and twenty-six colleges. One man in the communion subscribed \$1,000,000 on the condition that \$5,300,000 additional be secured. These gifts are all to be paid within five years. The Disciples now have underwritten \$4,000,000 in pledges and will finish the task on June 1, 1918. This movement is the forerunner and pace-setter for similar movements in other large communions. The president of the general convention is Judge J. N. Haymaker, of Wichita, Kan.; the secretary is Robert Graham Frank, of Liberty, Mo.

**DISEASE, RELATION OF FOOD TO.** See **FOOD AND NUTRITION.**

**DISEASE CARRIERS.** See **ROCKY MOUNTAIN SPOTTED FEVER.**

**DISEASES, OCCUPATIONAL.** See **OCCUPATIONAL DISEASES.**

**DISINFECTANTS.** See **DAKIN'S SOLUTION.**

**DOBRUDJA.** See **WAR OF THE NATIONS.**

**DOCKS AND HARBORS.** With the continuance of the great war comparatively little was heard of European projects for port development, though undoubtedly much new work of a military character such as in Russia was under way. In the United States the large export commerce particularly emphasized the need of better facilities, and improvements were in progress at many of the large ports such as New York, Boston, and Philadelphia along lines previously determined. There were also developments more or less new, some of the more significant of which are given in the accompanying paragraphs.

**NAVAL DRY DOCK AT PHILADELPHIA.** At the end of the year the United States Navy Department was asking for bids for a dry dock at the League Island Navy Yard, Philadelphia, large enough to handle any American vessel built or under construction. The dimensions of this proposed structure were as follows:

Length over all, outside dimensions.....	1064.8 ft.
Length over all, inside dimensions.....	1022.
Width over all, outside dimensions.....	212.5
Width of entrance, mean high water.....	132.6
Depth, mean high water .....	40.

This dock was to be built of concrete, reinforced where necessary and with pile foundations where required. Preliminary estimates of the excavation and material, required were: Excavation 860 cubic yards; concrete, 176,000 cubic yards; piles, 495,000 lin. feet; structural steel, 120 tons; reinforcing steel, 750 tons; cast iron, 200 tons.

**OTHER AMERICAN DRY DOCKS.** Progress continued during the year on the 1000-ft. dry dock at Boston being built by the State of Massachusetts, while the new 1000-ft. dry dock at Balboa in the Canal Zone was completed. The new dock at Balboa is 1000 ft. long and 110 ft. wide, with a depth of 35 ft. over the blocks at mean tide. The rates charged for use of the Balboa dock were 25c. per ton for docking and undocking, and 15c. for each lay day. On the St. Lawrence at Levis, opposite Quebec, the Canadian government had a dry dock of similar length under construction. On the Pacific at San Francisco a government subsidized dry dock was building, over 1000 feet in length, while at Pearl Harbor, Hawaii, the United States navy had under construction a dock of equally large dimensions. Such structures must be considered in any scheme of naval preparedness and with the increase of the United States navy it was thought that an even larger number must be provided.

**PROPOSED BAYONNE, N. J., TERMINAL.** During the year plans were formulated for a new marine and industrial terminal at Bayonne, N. J. This was to be built by a private corporation in cooperation with the city of Bayonne and to resemble the famous Bush terminal in Brooklyn. It was not only to consist of piers but was to contain warehouses and factories, with ample railway entrance and track accommodation. According to the engineers of the project in a description of the first unit: "The installation will provide on upper New York Bay dockage for 30 modern freight ships in addition to lighters, barges, etc., a railroad yard with facilities for classifying and assembling freight with a capacity of 1000 cars, a ferry terminal for a Bayonne-Manhattan vehicular and passenger ferry, four miles of bulkhead platform, 1,350,000 sq. ft. of one-story bulkhead sheds and 7,770,000 cu. ft. of second- and third-story bulkhead sheds, and over 200 acres of land for industrial buildings together with trolley and highway connections, railroad sidings, float bridges for railroad cars, etc.

"The total estimated cost of this installation is \$7,234,545, of which \$2,121,673 is for dredging, bulkheading, and reclamation, and \$5,112,872 for the other facilities. These estimates provide for interest on the cost during construction and provide for 35 ft. depth of water."

**PROPOSED CAMDEN, N. J., TERMINAL PIERS.** The necessity for better and more adequate har-

bor facilities was shown during the years 1915 and 1916, and the State of New Jersey through its Board of Commerce and Navigation was alive to the further utilization of its valuable shore front, particularly in New York harbor and the Delaware River. The chief engineer of the commission, B. F. Creason, in a report on the development of the port of Camden, directly across the Delaware River from Philadelphia, by the construction of two new piers at a cost of approximately \$1,000,000, advised that on one of these there be placed large storage warehouses, so that ships, trucks, and railway cars could be loaded directly from one to another or into the warehouses with a minimum of handling and the greatest possible economy.

The pier proposed in the plans was to be a solid filled structure 328 feet wide, with a timber bulkhead and a platform constructed outshore of the bulkhead to provide deep water wharfage. It would provide dockage for a 600-ft. ship on one side and a 480-ft. ship on the other. It was to be divided longitudinally into two separate operating parts, with a driveway in the middle.

A three-story shed was to be built along the north and south sides of this pier. The lower floor would have a vertical clearance of about 22 ft. for the protection and handling of cargo in transit. The second and third floors, each of which was to be stepped back 5 ft. on the water-side to provide a landing and working platform for cargo, would have a vertical clearance of about 12 ft.

On the lower level there were to be two railroad tracks in a pit immediately adjoining the floor and within the building. The elevation of the pier floor was to be the same as that of the floor of the car, and this would facilitate the handling of freight between the pier deck and the cars. Immediately to the rear of the shed would be a platform 10 ft. wide at the elevation of the car floor, and adjoining this would be a street or roadway 60 ft. in width. The second floor was to have a width of 111 ft. exclusive of the landing platform, and the third floor was to have a width of 106 ft. exclusive of the landing platform. The shed on the northerly side was to have a length of 560 ft. and on the southerly side was to have a length of 480 ft.

This report was submitted on December 16th and was of interest in view of the extensive port developments taking place across the river in Philadelphia.

**MUNICIPAL DOCKS AT ASTORIA.** During the year there were completed for the Port of Astoria, Oregon, two large timber and earth-fill piers as portions of the municipal terminal for ocean-going traffic. These two piers are 1300 feet in length and enclose a slip 400 feet wide at the entrance and 250 feet wide at the rear end. The general type is a pile structure which incloses with a bulkhead 7000 feet in length an earth fill amounting to 43 acres and formed largely from the material dredged from the slips and channels. The slips, of which there are two, have been dredged to a depth of 30 feet, leaving an extra five feet to be removed at some future date. The piers carry a complete system of tracks and driveways and on pier No. 1 there is a freight shed or building 1085 feet in length and 90 feet in width of special construction of timber frame, hollow tile fire walls, and reinforced concrete, with steel sash and steel doors. A complete fire protection system including

sprinklers and outside fire hydrants was installed so that a low rate of insurance was received.

**JACKSONVILLE MUNICIPAL DOCKS.** The new municipal docks at Jacksonville, Fla., which had been under construction for about two years, were completed and opened to use in 1916. They are located about 3.7 miles from the city hall on the St. John River, and enjoy full riparian rights to the 30-ft. channel which was being dredged by the Federal government, to a minimum depth of 26 ft. One mile of water frontage was secured.

As completed there was docking space for 14 freight steamers, with a three-quarters of a square mile 30-ft. depth anchorage in front of the dock. There were two piers, each 1000 ft. in length by 260 ft. in width; one an open pier for handling lumber, rosin, turpentine, tars, and other commodities not injured by the weather; the other with two large steel warehouses 800 ft. long by 73 ft. wide. Both piers were of timber extensions outside of fill, and were paved with vitrified brick set in cement. They were connected by railroad tracks to the municipal belt railroad.

The improvement also included reinforced-concrete warehouses back from the pier but on the railroad, in which were installed two cotton compresses, one of which produced a rectangular bale somewhat smaller than the ordinary cotton bale, and thus saved in shipping rates. The piers and the warehouses were all equipped with fire-fighting appliances and fire pumps.

**ST. LOUIS MUNICIPAL DOCK.** The contract for the first section of the municipal dock to be built at the foot of North Market Street, St. Louis (see *YEAB BOOK* for 1915), was awarded during the year 1916. The revised plans for the structure called for five units, each of 160 feet length with a space of about 22 feet width between, in which would be installed high capacity elevators for lifting large automobile trucks from street level to boats or vice versa, depending upon the range of water, which here amounted to about 42 feet. The work was to be done under the direction of the Department of Public Utilities for the city of St. Louis.

**PIERS IN THE CANAL ZONE.** The new pier No. 7 at Cristobal, Canal Zone, was put to use for unloading cargoes during 1916. It is 1035 x 212 ft. and is carried on 212 concrete filled steel cylinders 6 ft. in diameter and 125 ft. long, with tops at water level. Pier 7 has a railroad track running outside along the walls, for handling freight. The total cost of the pier was \$1,420,000. With its completion there were available at Cristobal 581,150 sq. ft. of floor area in the new concrete dock and pier system at the Atlantic terminal of the canal, of which area 418,180 sq. ft. were inclosed. To provide for a still larger demand, preliminary work was begun and the contract let for the steel cylinders for another concrete pier of the same size as No. 7, to cost about \$1,500,000 and to be completed within two years.

**TIDAL DOCK AT CHEMULPO, KOREA.** The Japanese government in 1916 had under construction a large tidal lock 700 x 1500 feet inside dimensions in the harbor of Chemulpo, Korea, where they were undertaking considerable improvements. As this port is exposed to an extreme range of tides the tidal locks and the gates at the ocean end had to be designed with

special safety devices. The works under construction included an inclosed basin, the Jinsen dock for mooring vessels, and a tidal lock connecting with the outer harbor. A minimum depth of 27.5 feet will be maintained in the lock and if the tide falls below this point the vessels will be locked in and out, whereas at higher stages they can have direct access from harbor to mooring basin. The lock has a clear width of 60 feet and a length of 424 feet between the gates with a depth of 48 feet, which affords a free board of 4 feet above the high water of ordinary spring tides. The walls of the lock are of mass concrete faced with granite at the gate quoins and sills and other important points and the heavy floors, from 10 to 15 inches thick, are reinforced with steel rails. Many of the ideas so successfully used on the Panama Canal were adopted for the construction and operation of valves and gates, which were built in the United States. This tidal lock is described by one of its designers in *Engineering Record*, Dec. 2, 1916.

**NEW HARBOR BASIN AT COPENHAGEN.** For the walls of a new harbor basin under construction at Copenhagen, Denmark, large reinforced concrete caissons built in a special dry dock were floated into position. The port improvement involved the creation of a harbor of 31 ft. depth of water, and the basin is rectangular in shape with three sides 876 feet, 407 feet, and 202 feet in length respectively. The front part of the basin is formed by a row of 22 reinforced concrete caissons, the main types of which are 162 feet in length, 32 feet high, and 16 feet wide, with 14 compartments formed by cross walls extending to the complete height, with three large openings to save weight. The reinforcement consisted of plain round rods and about 700 tons of steel and 13,900 cubic yards of concrete made of the 1:2:3 proportions.

After being built in the dry dock the caissons were moved to near the dock site and then finished and sunk into position on a specially prepared bottom. Each end had a key fitting to the next end key and these key joints are later grouted. The caissons when sunk are filled with sand though filled with concrete behind the face wall and the dock wall proper is made of 1:3:5 concrete with granite face. The new basin and its piers are provided with warehouses and railway tracks, all with the most modern equipment.

**GIRARDOT.** Important port improvements at Girardot, Colombia, in the Magdalena River, were to be started in accordance with a law enacted in 1913, the plans having been approved by the minister of agriculture and commerce. A board of engineers had been appointed to supervise the work. Girardot is of particular importance as a shipping point because it is the only port connected by rail with the city of Bogotá and at the same time connects with the Polima Railway running to Espinal.

**DODD, FRANK HOWARD.** An American publisher, died in New York City, Jan. 10, 1916. A son of Moses Woodruff and Rachel Hoe Dodd, he was born in Bloomfield, N. J., April 12, 1844. His mother came of the family famous for the Hoe printing press. His father, in 1839, had become a partner of John S. Taylor in the publication of religious and theological books, the business being picturesquely and appropriately housed in Brick Church Chapel, City Hall Square, New York. By 1840, Moses W. Dodd had taken over his partner's interest. The son

graduated from Bloomfield Academy; then, in 1859, instead of entering Yale as he had planned, he joined his father.

Succeeding to control of the business in 1870, Mr. Dodd took as a partner Edward S. Mead, who died in 1894. Bleecker Van Wageningen, after 33 years as a member of the firm, retired in 1909. Robert H. Dodd, who has long had charge of the retail and rare book and manuscript departments, joined his brother in 1889; in 1903 a son, Edward H. Dodd, who eventually succeeded his father, and Frederick W. Tufts, were taken in. Steadily, under the direction of Mr. Frank Dodd, the business grew from a small and uncertain beginning to an establishment ranking among the great publishing houses of the country. After several changes in location, a new building was erected in 1910 at Fourth Avenue and 30th Street, the pioneer structure in a district now including many publishing houses. To make it such a centre Mr. Dodd worked tirelessly; for several years he served as president of the Fourth Avenue Association. His activity in all that concerned the interests of American publishers was recognized by his election as president of the American Publishers' Association.

The larger growth of Dodd, Mead and Company, which must be recorded as part of the record of Mr. Dodd's life, may be said to date from their publication of Ian Maclaren's (Dr. John Watson's) *Beside the Bonnie Brier Bush* in 1894. E. P. Roe's *Barriers Burned Away* had been an earlier success. Mr. Dodd became a warm friend of Ian Maclaren, as he did of Robertson Nicoll, Austin Dobson, Beatrice Harraden, Clement Shorter, and other foreign writers of whose books he was American publisher. Maarten Maartens and E. V. Lucas were included in his circle of acquaintance abroad. Although the firm continued to bring out a variety of books, Mr. Dodd himself in his later years gave a large share of his interest to the development of a standard reference work, the *NEW INTERNATIONAL ENCYCLOPEDIA*. As early as 1884 the firm had purchased a reprint of *Chambers' Encyclopædia* called *Alden's Library of Universal Knowledge*, which was revised and enlarged as the *International Encyclopædia*. But he saw the need for a new American work modeled on the lines of the great German enterprises of Brockhaus and Meyer. Accordingly, three years were devoted to the preparation of the *NEW INTERNATIONAL ENCYCLOPEDIA*, and when it was published in 1903 it at once took rank with the best of similar books. Mr. Dodd lived to see it completely revised in a second edition (1913-16). To serve either as supplements to the *ENCYCLOPEDIA* or as separate reference volumes, the *NEW INTERNATIONAL YEAR BOOKS* have been issued annually since 1907. Another enterprise was the founding in 1895 and promotion of *The Bookman*, a monthly magazine of literary news and discussion.

Besides the cares of his immediate business, Mr. Dodd assumed responsibilities in other fields—civic, philanthropic, financial, social. He held the presidency of the Riverside Association for many years, as well as that of the Fourth Avenue Association; was trustee of the New York Kindergarten Association; trustee of the Greenwich Savings Bank; an active member of the Century and City Clubs; and also a member of the National Club in London. His wife, who

survived him only a few months, was Miss Martha Bliss Parker, daughter of the Rev. Joel Parker, first president of Union Theological Seminary.

**DODGE, GRENVILLE MELLE**. An American soldier and railway engineer, died in Council Bluffs, Iowa, Jan. 3, 1916. He was born near Danvers, Mass., in 1831, and although self-supporting from the age of 10, he was able to take the combined military and scientific course at Norwich University (Vermont), where he graduated as a civil engineer in 1850. Soon afterward he went west and became a surveyor for the Illinois Central Railroad and then for the Rock Island, and, after his removal in 1854 to Council Bluffs, where he acquired banking interests, he was employed on the survey for Union Pacific. For a time he was engaged in trading in Colorado and among the Indians of the plains. As colonel of the Fourth Iowa Infantry, Dodge gained a name in the early part of the Civil War by his services at Springfield, Mo., Sugar Creek, and Pea Ridge. In the last named battle three horses were shot under him, a fourth wounded, and he lost a third of his regiment and all his field officers. At that time only 31, he was promoted to brigadier-general. While in command of a division of the Army of the Tennessee, in 1863, his assistance to Grant and later to Sherman was such as to earn him the rank of major-general, with command of the sixteenth army corps. In the same year he took a prominent part in the decisive battle of the Atlanta campaign and became commander of the Army of Missouri, under Sherman. After the close of the war, General Dodge made several campaigns against the Indians, but he resigned in 1866 to take charge of the construction of the Union Pacific Railroad. Within three years the road was completed; Dodge himself had personally surveyed the route and discovered the pass that was used across the Continental Divide. Later he built the Texas Pacific Railroad, an iron bridge over the Missouri between Omaha and Council Bluffs, and railroads in France, Germany, Switzerland, Canada, and Mexico. He was prominent in various patriotic organizations, and in Republican politics, having served a term in Congress (1867-69), and in 1898 he was chairman of the commission appointed by President McKinley to inquire into the management of the war with Spain. Up to 1909 he was chairman of the board of directors of the Colorado and Southern Railway.

**DOMINICA**. A presidency of the Leeward Islands colony (q.v.). Roseau, the capital, had, at the 1911 census, 6577 inhabitants. Coffee, sugar, spices, oils, timber, fruits, etc., are exported. Trade and finance statistics are given in the following table:

	1909-10	1910-11	1913-14	1914-15
Imports .....	£128,779	£147,832	£175,590	£205,778
Exports .....	102,839	112,111	190,701	218,375
Revenue .....	89,521	42,133	48,143	48,896
Expenditure ...	41,860	39,603	47,573	53,486
Shipping* ....	718,227	694,985	572,222	650,144

\* Tonnage entered and cleared.

**DOMINICAN REPUBLIC, THE**. An independent West Indian state, occupying the larger and eastern part of the Island of Haiti. Capital, Santo Domingo.

**AREA, POPULATION, ETC.** The area of the 12

provinces comprising the republic is estimated at 48,577 square kilometers (18,756 square miles). Estimated population, Dec. 31, 1914, 657,270. Most of the inhabitants are Spanish-speaking and form a mixed race of white, negro, and Indian blood. Santo Domingo, founded 1496, and thus the oldest town in the Western Hemisphere, has probably about 26,000 inhabitants; Santiago, 20,000; Puerto Plata and San Pedro de Macoris, 15,000 to 16,000 each; Samaná, Sánchez, La Vega, Agua, Moca, and Monte Cristi, 4000 to 5000 each. Reported births in 1914, 24,319; deaths, 6393; immigration, 3930; emigration, 1587. Primary instruction is free and nominally compulsory. The reported number of schools in 1914 was 518, with 16,124 pupils. The state religion is Roman Catholicism, but the exercise of other religious forms is permitted.

**PRODUCTION, COMMERCE, ETC.** The leading crops commercially are sugar cane and cacao. Other crops are tobacco, coffee, cotton, and bananas and other fruits. The tobacco industry suffered on account of the great war, as Germany was the principal buyer of the crop, but in 1915 and 1916 new and satisfactory markets were found in France. The demand for a substitute for German dyestuffs gave a new impetus to logwood exploitation. Cattle raising has become a well-established and profitable industry. There is a considerable production of honey and wax. Manufacturing has attained little and mining even less importance.

Imports and exports of merchandise have been valued as follows:

	1913	1914	1915
Imports .....	\$9,848,889	\$6,729,007	\$9,118,514
Exports .....	10,047,297	10,588,787	15,209,061

Leading imports in 1915, in thousands of dollars: cotton manufactures, 1913; iron and steel manufactures, 1201; rice, 909; wheat flour, 585; meat and dairy products, 541; oils, 514; leather and manufactures thereof, 297. The increase in export values in 1915 was due more to advance in prices than to increase in quantities. Thus the cacao export in 1914 amounted to 20,745 metric tons, valued at \$3,896,489; in 1915, 20,223 metric tons, valued at \$4,863,754. The sugar export in 1914 amounted to 101,429 metric tons, valued at \$4,943,452; in 1915, 102,801 tons, \$7,671,383. Other exports in 1915: leaf tobacco, \$972,896; coffee, \$458,431; cattle hides, \$185,272; wax, \$113,050. The foreign trade is principally with the United States; imports from and exports to the United States in 1915 were valued at \$7,361,259 and \$12,044,271 respectively. Imports from and exports to Germany declined from about \$1,678,000 and \$2,068,000 respectively in 1913 to \$95,317 and \$5644 in 1915.

The length of railway in operation is reported at 282 kilometers (175 miles); there are, besides, private lines for sugar plantations reported at 362 kilometers (225 miles). Additional railway is projected or under construction. Telegraphs, 16 offices, with 352 miles of line. Santo Domingo and Puerto Plata have foreign cable connection. Radiotelegraphy has been established. There are about 100 post offices.

**FINANCE.** The unit of value is the American dollar. For the fiscal year 1916, estimated revenue and expenditure were \$4,468,000 and \$4,406,567 respectively. Revenue is derived principally from customs duties. These in 1914 were \$3,094,

585 and in 1915, \$3,882,048. The 1915 customs comprised import duties, \$3,555,226; export duties, \$231,951; port dues, \$94,872. Of the total, \$1,197,856 was derived at Santo Domingo, \$862,987 at Puerto Plata, \$731,604 at San Pedro de Macoris, and \$712,803 at Sánchez. The cost of collection was less than 4 per cent. A treaty between the Dominican and American governments authorized a loan of \$20,000,000 for the conversion of the debt, and established an American receivership of customs from April 1, 1905. The sum of only about \$14,000,000 was issued, the remainder being kept against certain disputed liabilities and the provision of a fund for public works. The amount outstanding at the end of 1914 was \$13,042,850. A further loan of \$1,500,000, having no connection with the original loan, was issued in 1913. Both loans are guaranteed by the customs. By agreement between the Dominican Republic and the United States in 1914, an American financial expert was appointed to control the national expenditure and the revenues other than those derived from customs.

**GOVERNMENT.** The executive authority is vested in a president, who, according to the constitution, is elected by indirect vote for six years. He is assisted by a cabinet of seven members. The legislative power is exercised by a congress of two houses, the Senate and the Chamber of Deputies. Senators (12 in number) are elected for six years; deputies (24) for four years. In 1913 José Bordas Valdés became provisional President, assuming office April 14th. After the insurrection of 1914, Bordas Valdés resigned (August 27th), and Ramón Báez was elected provisional President by the Congress. At elections held later in 1914, Juan Isidoro Jiménez was chosen President, and on December 5th was inaugurated for the six-year term. On July 26, 1916, Francisco Henríquez y Carvajal was proclaimed provisional President. See *History* below.

**HISTORY.** The revolutionary movement in the Dominican Republic continued during 1916 and resulted in American intervention. The President, Isidoro Jiménez, who had been elected in 1914 under American supervision, had been involved in constant trouble with his congress and as a result of certain disputes over the budget was impeached at the beginning of May and abdicated on May 7th. In the revolutionary disturbances that followed, American marines were landed, some 2000 in number, in order to insure a free election. Their landing took place at Monte Cristi and Puerto Plata under Admiral Caperton, who issued a proclamation on June 15th saying that the United States would not conquer the country or encroach upon its sovereignty and that the only reason for the presence of marines was to insure the restoration of order and the introduction of necessary reforms. There were engagements between the American and the rebel forces, in July in the course of operations by the former around Santiago, and there was further trouble in October. For details of this see the article on UNITED STATES, section *Foreign Relations*. On July 26th Carvajal was chosen provisional President, as noted above.

**DONALD, JOHN A.** See SHIPPING BOARD.  
**DORSEY, HUGH M.** Elected Democratic Governor of Georgia, Nov. 7, 1916.

**DOUAUMONT.** See WAR OF THE NATIONS.

**DOURINE.** See VETERINARY MEDICINE.

**DOYEN, EUGENE LOUIS.** A French bacteriologist and surgeon, died in Paris, Nov. 21, 1916. He was born in Rheims in 1859. In 1895 he established a private clinic in Paris, where he conducted experiments and devised improvements in surgical technique. At various times he made startling announcements regarding cures for different diseases, but many physicians came to discount his reports, and a number of his conclusions have not been verified by other investigators. Doyen is probably best known for his study of cancer. In 1902 he announced the discovery of a toxin of the disease, but this has not been accepted generally. He also used an electrical method in treatment of cancer, and, besides, in treatment of tuberculosis. He is said to have been the first to use moving pictures of surgical operations. After the outbreak of the European war, he worked on experiments looking to a cure for tetanus, from which affliction the mortality among French soldiers had been great. He was the author of works on cancer, surgical subjects, etc.

**DRAINAGE.** There were no striking developments in the drainage of lands for agricultural purposes during the year 1916. The war in Europe occupied the attention of the countries which have engaged in such work in the past, while in the United States the wave of excitement in land reclamation, by both irrigation and drainage, which was so noticeable a few years ago, had subsided.

**UNITED STATES.** In the United States drainage work has consisted largely in continuing work already under way and in the settlement and improvement of lands already drained. Few State legislatures met in 1916, and hence there was no new drainage legislation. The years 1913 and 1915 witnessed much drainage legislation, and some points in the laws passed have been adjudicated during the year 1916. The general principle followed in financing drainage work is that the cost of drainage shall be assessed upon the lands benefited in proportion to the benefits received, but there has been a tendency to include in drainage districts lands not actually benefited or lands benefited only incidentally. A case involving this point, coming from Louisiana, was decided by the United States Supreme Court (*Nyles Salt Co. v. Drainage District No. 64*, U. S. 239, p. 478), the court overruling the assessment of benefits on lands not actually benefited but which were included in the district for the purpose of deriving revenue for the benefit of other properties. In the irrigated sections of the United States much of the land in need of drainage is brought into that condition by seepage from higher irrigated lands and from irrigation ditches, and several of the Western States have amended their drainage laws by providing that in case lands are injured by "irrigation water from high land . . . such high land shall be considered as being benefited to the extent and in the amount that such lands are responsible for damage to low lands from seepage and saturation from irrigation water." (Laws of Idaho, 1915.) Under this law certain irrigation companies in Idaho were assessed to meet the cost of drainage of low lands lying below their canals, and this action has been upheld by the State Supreme Court. (*In re Drainage District No. 1, Canyon County, Idaho.*) The two decisions referred to are far reaching, and may have

a large effect on future drainage work in the United States.

The organization of drainage districts in the humid sections of the country is largely for the purpose of extending the agricultural areas, and since the demand for new land has not been great, there has been no general activity in this section, although work is in progress in many large districts, particularly in the Mississippi Valley throughout its length and in the valley of the Red River of the North in Minnesota and the Dakotas. Plans for flood protection in Ohio, under the State "Conservancy Act" have progressed, the organization of the Miami district having been approved, and it is expected that work on that district will proceed. Drainage work in the Florida Everglades is progressing, but the lessened demand for land has limited this work somewhat.

In the arid region of the United States, on the other hand, drainage districts are organized almost exclusively for the purpose of protecting or reclaiming lands already farmed, which have been or are being injured by irrigation or by seepage from irrigated lands or irrigation canals. In such sections the demand for drainage comes from the necessity of protecting investments already made and does not depend to any extent upon the demand for land, consequently there has been considerable activity in this field. It is estimated that within the last few years nearly 220,000 acres of irrigated lands have been drained, while very much larger areas are in need of drainage. Estimates of the area needing drainage are of little value because this area is spreading rapidly. In many irrigated valleys the situation is becoming very serious. This is true of the land along the entire course of the Rio Grande in Colorado, New Mexico, and Texas, along the Snake River in Idaho, and in most of the irrigated sections in Wyoming. It has not been found possible to irrigate land in such a way that there will not be surplus water escaping by deep percolation until it raises the ground water and injures either the land on which it is used or other land lying at lower elevations, both by saturation and by an accumulation of alkali. The remedy for both conditions is under drainage. Drains must be placed deep enough to keep the ground water below the root zone of plants and also below the point where capilarity can bring the alkali salts in solution to the ground surface. In many cases where low lands are injured by water coming from higher lands the ground water is flowing under pressure in a porous stratum at a depth at which it is not practicable to lay drains. It has been found possible in such cases to put down wells into the porous stratum which will allow the water to rise to a level from which it is practicable to remove it by drains. The discovery of this possibility has made it feasible to drain many areas which had been considered hopeless. In other cases it has been found possible to intercept the ground water coming from higher levels before it reaches the low lands, thus avoiding the necessity of draining the low lands. The draining of large areas of irrigated lands is making available a considerable supply of water for use in irrigating other lands, and where this is possible drainage is proving a double benefit.

**FOREIGN COUNTRIES.** The European war is occupying the attention of so large a part of the world that little attention is being given to

drainage outside of the United States. In the Nile delta drainage works are being constructed, but the work is being much curtailed by lack of funds due to the war. The same thing is true of drainage in the irrigated sections of India. See FLOODS.

**DRAKE, ALEXANDER WILSON.** An American art editor and wood engraver, died Feb. 4, 1916, in New York. He was born near Westfield, N. J., in 1843 and was early apprenticed to a leading wood engraver, William Howland. In 1865 he became a master engraver and went into business for himself. Five years later, with Richard Watson Gilder and others, he became identified with *Scribner's Monthly Magazine*, which from 1881 was the *Century*. As art director of this magazine and of *St. Nicholas*, until his retirement in 1913, Mr. Drake held a foremost place in the development of illustration in the United States. He did much to gain recognition for Timothy Cole, Jüngling, F. S. King, and other notable wood engravers, and for artists in other fields. For a time he taught drawing at Cooper Institute. Just before his retirement a dinner was given in his honor by more than 400 members of leading literary and artistic clubs, among them the Aldine Club, which Mr. Drake had helped to found. His home contained thousands of art objects, his collections of brass and copper and of rings being especially famous.

**DRAMA, AMERICAN AND ENGLISH.** After two years of commercial depression occasioned by the initiation of the great war, the theatre business, not only in America but also in England, became unusually prosperous in 1916. In England the non-combatant public patronized the theatre in an effort to forget the war, and the same motive led to a crowding of the theatres by the many military men who were sent home, either invalided or on leave, from the trenches in France. In America, the prosperity occasioned by the peculiar situation of this neutral country led to a more than customary willingness on the part of the general public to spend money for theatrical entertainment.

A year when the public was peculiarly predisposed to patronize the theatre ought, in theory, to have been employed judiciously to advance the standards of dramatic art. In fact, however, no notable advance was made, either in England or in America. In England, the leading playwrights were too strenuously occupied with more important labors to devote much attention to writing for the theatre; and the majority of pieces shown in London were entertainments of the lighter sort, many of which were borrowed from America. The only important play that was contributed by any of the acknowledged leaders of the British drama was *A Kiss for Cinderella*, by J. M. Barrie, which was produced in London in the spring, with a cast including Hilda Trevelyan and Gerald Du Maurier, and was reproduced in New York on Christmas night, with a company headed by Maude Adams. In this delightful phantasy, the author took the traditional tale of Cinderella and made it happen inside the head of a little London slavey who dreamed that she herself was the heroine of the story. The piece was written with that exquisite combination of sentiment and humor which is characteristic of Barrie at his best. Of all the new plays of the year, *A Kiss for Cinderella* is the one most likely to endure.

Very few war plays were produced in 1916.

In England the theatre-going public did not wish to be reminded of the war; and in America, also, the managers soon made up their minds that war plays did not pay. One of the worst plays of the year was a melodrama of the war, entitled *Margaret Schiller*, which was written by Hall Caine. The heroine was a German girl who secured employment as a governess in the household of the Prime Minister of England. Her intention was to murder him, but her motives became complicated when she fell in love with him instead. Finally, her impetuous younger brother made his way into the house and, in attempting to shoot the Prime Minister, shot the heroine by accident. Even the popularity of Elsie Ferguson was unable to rescue this ridiculous melodrama from the failure it deserved. Early in the year a bit of pacifist propaganda entitled *The Greatest Nation*, by Marion Crichton and William Elliott, went down to speedy failure; and, in the autumn, a rather pleasing comedy by Grant Stewart and Robert Baker, entitled *Arms and the Girl*, which was set in Belgium at the outbreak of the war, was unable to endure the drastic competition of the first pages of the daily newspapers. This play deserved to succeed, for it told a pretty story of adventure; but the prejudice against war plays was so potent that it was withdrawn after a run of only a few weeks.

In the American theatre, the year must be regarded as a period of wasted opportunity. The theatre business was so brisk that nearly all the managers were making money; and, for the first time in its history, the native American drama was protected from any serious competition from abroad. In theory, the moment was propitious for an earnest effort to develop a serious drama in America by encouraging the production of ambitious plays by native authors. But the commercial managers remained obtuse to this extraordinary opportunity, and contented themselves, for the most part, with producing machine-made imitations of the most successful plays of former seasons.

This obtuseness, however, resulted indirectly in the most significant movement of the season in America. This was a spontaneous movement in support of worthy plays produced by semi-professional societies in little theatres on the side. This impulse became so widespread as to take on the proportions of a general and democratic insurrection against the oligarchical control of all the theatres in America by a narrow circle of commercial managers. In city after city, little theatres were organized and founded, where great plays were produced by people who cared less for money than they cared for art. The success of the Portmanteau Theatre was symptomatic of the general movement. This was a portable playhouse, invented and perfected by Stuart Walker. The proscenium, the stage, the scenery, the lighting-plant could be set up in two hours, either indoors or out of doors; and the whole equipment could be taken down and packed away, in another two hours, for trans-shipment to another place. With this convenient theatre, Mr. Walker produced a repertory of at least a dozen plays of quite extraordinary beauty, including three of the masterpieces of Lord Dunsany—*King Argimenes*, *The Gods of the Mountain*, and *The Golden Doom*. His scenery and lighting were unusually lovely, and the acting of his company was better than the average.

In New York, the Washington Square Players,

after two successful seasons at the Bandbox Theatre, moved over to Broadway, rented the Comedy Theatre for the entire year, and proceeded to continue their success. Their finest achievements of the year were a beautiful production of Maeterlinck's *Aglavaine and Sélysette*, and a programme of four one-act plays which included *Bushido*, a classic masterpiece of tragedy translated from the Japanese. At the Neighborhood Playhouse, in Grand Street, many excellent performances were given by a semi-professional company. The best of these was the first production on any stage of one of the very greatest one-act plays in all dramatic literature—*A Night at an Inn*, by Lord Dunsany. In the autumn, Gertrude Kingstone appeared at this little theatre in a triple bill composed of another new play by Lord Dunsany, entitled *The Queen's Enemies*, and two plays by Bernard Shaw, *Great Catherine* and *The Inca of Perusalem*. The success of this production was so great that it was subsequently transferred up-town to the Maxine Elliott Theatre. Another semi-professional company, called The Provincetown Players, was organized in the autumn, and offered a series of original one-act plays in a little theatre in MacDougal Street.

Several of the finest achievements of the year were accomplished by these little theatres on the side. It was a significant circumstance that, in the month of December, no less than four plays by so non-commercial a dramatist as Lord Dunsany could be seen on a single block of 39th Street in New York. No less symptomatic of the change in public sentiment was the triumphant return of *The Yellow Jacket*, by George C. Hazleton, Jr., and J. Harry Benrimo. This imaginary Chinese play is one of the very finest fabrics of dramatic authorship that America has yet produced. When the piece was first offered in New York, in 1912, it failed commercially. Since then, it has been acted with success in England, Germany, Austria, Hungary, Russia, Spain, and South America. In the autumn of 1916, *The Yellow Jacket* was brought back to New York for a series of special matinees; and the success of this tentative undertaking was so great that it soon became necessary to promote the production to the status of a regular attraction. In the evenings, as in the afternoons, *The Yellow Jacket* continued to make money; and its tardy but triumphant popularity gave the lie at last to the contention that good art cannot pay. Toward the end of the year Klein's *Music Master*, with David Warfield in his familiar rôle was revived with success.

Throughout the year, the finest scenery and lighting were shown in little theatres on the side, where many able artists did great things because of the supreme incentive to labor for the joy of working; but the impulse was carried over into the commercial theatre. The able American artist, Robert E. Jones, was employed by Arthur Hopkins to collaborate in all of his productions, and furnished a series of very lovely settings for *The Devil's Garden*, by Edith Ellis, *The Happy Ending*, by J. and L. du Rocher MacPherson, and *Good Gracious Annabelle*, by Clare Kummer. The Austrian artist, Josef Urban, continued to furnish sumptuous settings for productions so diverse as James K. Hackett's *Macbeth* and *The Merry Wives of Windsor* and Charles B. Dillingham's musical revue entitled *The Century Girl*, which was installed, in the autumn, in that mausoleum of abandoned hopes which used to

house the New Theatre. Excellent scenery was also designed by Mrs. John W. Alexander, for *A Kiss for Cinderella*, and for *His Bridal Night*, a trivial play by Lawrence Rising and Margaret Mayo, in which the pattern of Plautus was applied to the immediate problem of manufacturing a farce for the Dolly Sisters.

Winthrop Ames, after a year of inactivity occasioned by ill health, returned to active management in the autumn of 1916 and made a very beautiful production of *Pierrot the Prodigal*. This celebrated pantomime was first produced in Paris a quarter of a century ago, under the title of *L'Enfant Prodigue*. The scenario was devised by Michel Carré, and the incidental music was composed by André Wormser. The play itself is a classic of the dramaturgic art; and the exquisite production exhibited by Mr. Ames afforded one of the most beautiful adventures of the year. *Pierrot* was presented at the Booth Theatre and later was transferred to the famous Little Theatre. Mr. Ames also produced very charmingly a little comedy called *Hush!*, by Violet Pearn; but the undertaking failed because the subject that was satirized seemed already a little out of date.

Of the serious American plays produced in 1916, the best was *God and Company*, by H. Austin Adams, which was shown for only two performances, by the Stage Society, in New York. This was a very powerful play which attacked sardonically as a humbug the popular conception of religion. The central figure was a preacher who believed he was accomplishing the will of God when he employed his gift of easy eloquence to make the women of his congregation fall in love with him. The leading American playwright, Augustus Thomas, contributed a very skillful melodrama, *Rio Grande*. As a technical accomplishment, this play was exceedingly ingenious; but it failed of popularity because the public did not happen to be interested by its subject-matter—the peculiar psychological reactions in regard to sex that are likely to arise in an environment so preponderantly masculine as an army camp. Eugene Walter brought forth a piece called *Just a Woman*, which, although effectively theatrical, appeared a little crude because of its excessive emphasis. One of the best American plays of the year was *Old Lady 31*, by Rachel Crothers, a charming study of the survival in old age of emotions remembered from the period of youth. This piece was admirably written, with a tactful intermingling of concordant strains of sentiment and humor. Langdon Mitchell made a tasteful but rather unexciting dramatization of Thackeray's *Pendennis*, which was acted by John Drew. For Otis Skinner, a pleasing but rather tenuous comedy, entitled *Mister Antonio*, was written by Booth Tarkington. Another play that, though charming, was a little thin in texture, was *Mr. Lazarus*, by Harriet Ford and Harvey J. O'Higgins, which was acted by Henry E. Dixey. Much more rich in narrative material was *The Man Who Came Back*, an interesting melodrama developed by Jules Eckert Goodman from a story by John Fleming Wilson. *The Co-Respondent*, by Alice Leal Pollock and Rita Weiman, told a journalistic story that was almost worthy of attention. Late in the season, the popular actress, Elsie Ferguson, appeared in an artificial and unworthy play, by Hulbert Footner, entitled *Shirley Kaye*.

Several of the most successful American plays





Photo by White Studio. © Charles Frohman, Inc.

**THE BALL OF CINDERELLA'S DREAM**  
Cinderella (Maude Adams) and Prince Hard-to-Please (Norman Trevor) lead the dance  
"A KISS FOR CINDERELLA" BY J. M. BARRIE



of the vintage of 1916 must be classed as sentimental instead of serious. One of the best of these was *The Cinderella Man*, by Edward Childs Carpenter, in which the pattern of the famous fairy-story was applied to a new posture of circumstances imagined to exist in New York City at the present time. Very pleasant also was *Come Out of the Kitchen*, a sentimental comedy by A. E. Thomas which was dramatized from a novel of the same name by Alice Duer Miller. In *The Harp of Life*, by J. Hartley Manners, an attempt was made to develop a serious play from the theatric scene which occurs at the close of the third act of *La Dame aux Camélias*. This attempt, artistically, was a failure; but the piece was carried to commercial success by the popularity of Laurette Taylor. Francis Starr appeared, to small advantage, in an artificial comedy of the Georgian era, entitled *Little Lady in Blue*, by Horace Hodges and T. Wigney Percyval, the authors of *Grumpy*. *Polyanna* was a sickly, saccharine, and utterly immoral composition, dramatized by Catherine Chisholm Cushing from a popular novel by Eleanor H. Porter. The heroine of this devastating play was an angel-child who insisted on being glad whenever she was run over by a motor-car. The traditional tale of Cinderella was employed once more—though, this time, ineffectively—in *Rich Man, Poor Man*, a dramatization by George Broadhurst of a novel by Maximilian Foster. *The Melody of Youth*, by Brandon Tynan, exhibited an ingratiating reminiscence of the artificial Irish plays of Dion Boucicault; but *A King of Nouchere*, by J. and L. du Rocher MacPherson, was a very feeble effort to recapture the charm of a foregone romanticism.

The best American melodrama of the year was *The 13th Chair*, by Bayard Veiller, a piece in which the element of mystery was ingeniously sustained until the final moment. *Under Sentence*, by Roi Cooper Megrue and Irvin S. Cobb, was an exciting melodrama which failed only because of an incoherence occasioned by a superabundance of narrative material. *The Silent Witness*, by Otto Hauerbach, and *The Guilty Man*, by Ruth Helen Davis and Charles Klein, both repeated the pattern made popular in former seasons by *Madame X* and *Common Clay*. *The Heart of Wetona*, by George Scarborough, was a fairly interesting melodrama, in which a story intended first to be projected in a New England setting was skillfully transferred by David Belasco to the environment of an Indian reservation in Oklahoma. *The Fear Market*, by Amélie Rives, narrated, with many obvious deficiencies of skill, a scandal which was current in the newspapers not many years ago. *The Intruder*, by Cyril Harcourt, was nothing but a play of Eugène Scribe's brought down to date. *The Flame*, by Richard Walton Tully, was an incoherent composition that made no sense whatever to the average spectator.

The vogue of the "trick-play," which had been current in 1915 and 1914, was considerably reduced in 1916. The only successful "trick-play" of the year was *Cheating Cheaters*, by Max Marcin. In this ingenious and diverting entertainment, the heroine was a detective who pretended to be a crook in order to pretend to be a lady in order to get the better of certain other people who were pretending to be ladies and gentlemen although, in actuality, they were nothing more than crooks. The pattern was extremely

complicated and was designed to mystify the audience; but, despite its obvious defects, the play succeeded because it was conventionally novel. *Coat-Tales*, by Edward Clark, was not successful, although, in this piece, the author employed the novel subterfuge of making his second act happen, not after, but before, his first act in the pattern of imaginary time. In *Any House*, by Owen Davis and Robert H. Davis, a novel device of stage-projection was wasted on a story that was traditional and dull.

No effort need be made to distinguish one from another the lighter American plays produced in 1916. A mere enumeration of their titles will suffice, since all of them exhibited, with more or less success, materials that were traditional. The list includes: *Turn to the Right!*, by Winchell Smith and John E. Hazard; *Nothing But the Truth*, by James Montgomery; *Captain Kidd, Jr.*, by Rida Johnson Young; *Erstwhile Susan*, in which Mrs. Fiske played, by Marian De Forest; *Our Little Wife*, by Avery Hopwood; *Seven Chances*, by Roi Cooper Megrue; *Mile-a-Minute Kendall*, by Owen Davis; *Upstairs and Down*, by Frederic and Fanny Hatton; *Fast and Grow Fat*, by George Broadhurst; and *Object—Matrimony*, by Jules Eckert Goodman and Montague Glass.

Among the European plays imported to America in 1916, the most important was *Justice*, by John Galsworthy, which achieved a very notable success. The piece was presented by John D. Williams, the leading part was acted by John Barrymore, and the stage-direction was entrusted to B. Iden Payne. Another noteworthy importation to America was *The Master*, a serious play by Hermann Bahr, which was exhibited with Arnold Daly in the leading part. Strindberg's *Easter* was presented very adequately by the Stage Society of New York, under the general direction of Madame Strindberg. Bernard Shaw was represented in America, not only by Gertrude Kingston's production of *Great Catherine* and Grace George's revival of *Captain Brassbound's Conversion*, but also by a superlative performance of his inefficient piece, entitled *Getting Married*, which was exhibited by William Faversham. *The Earth*, by James Bernard Fagan, was produced in New York by Grace George. Margaret Anglin revived Oscar Wilde's *A Woman of No Importance*, and subsequently played a thin and ineffective comedy called *Caroline*, by W. Somerset Maugham. *Paganini*, a trifling play, was written for George Arliss by Edward Koblauch—an author of American birth who, in 1916, became a British citizen and changed his name to Knoblock in order to indicate emphatically to the world that he was not a neutral in the war.

Sarah Bernhardt revisited America in 1916, at the age of 71, and showed herself, in spite of her infirmities, to be beyond question the greatest actress in the world. During the course of the year, E. H. Sothern said a formal farewell to the American stage in a series of performances of T. W. Robertson's *David Garrick* and Justin Huntley McCarthy's *If I Were King*.

SHAKESPEARE TERCENTENARY. The tercentenary of the death of Shakespeare was celebrated rather noisily, both in England and in America. The occasion offered an opportunity for unusual endeavors. In New York, James K. Hackett exhibited a very bad production of *Macbeth*, in which the leading parts were played by Viola Allen and himself. Subsequently, Mr. Hackett

presented a fairly satisfactory production of *The Merry Wives of Windsor*. Falstaff was humanly and richly played by Thomas A. Wise, and the merry wives were acted by Henrietta Crosman and Viola Allen. At the same time, Sir Herbert Tree produced in New York both *Henry VIII* and *The Merchant of Venice*. Both plays were very badly acted, and both were produced in the sumptuous style of the Victorian period. Far finer, as a tribute to the tercentenary of the poet's death, was the production of *The Tempest*, in the Elizabethan manner, which was exhibited at the Century Theatre by the Drama Society. The formal celebration of the anniversary was brought to a climax in New York by the production, late in May, in the stadium of the City College, of a masque composed especially for the occasion by Percy MacKaye, entitled *Caliban by the Yellow Sands*. This allegoric composition was not particularly worthy as a contribution to dramatic literature; but the performance, in the windy and rainy air of out-of-doors, was attended by thousands of obedient spectators, and the occasion is one to be remembered in the annals of the civic theatre. See also MUSIC, *Ballet*.

**DRAMA, CONTINENTAL.** See articles on French, German, Italian, Russian, Scandinavian, and Spanish Literatures.

**DREADNOUGHT.** See BATTLESHIPS.

**DRIFTING SAND FILTERS.** See WATER WORKS AND WATER PURIFICATION.

**DRINKING FOUNTAIN.** See HYGIENE.

**DROPSY.** See KARELL DIET.

**DROWNING.** See RESUSCITATION.

**DRUM FIRE.** See MILITARY PROGRESS.

**DRY DOCKS.** See DOCKS AND HARBORS.

**DUBLIN.** See CITY PLANNING; GREAT BRITAIN, *History*.

**DUBOIS, LOUIS ERNEST, CARDINAL.** See ROMAN CATHOLIC CHURCH.

**DUBOURG, AUGUST, CARDINAL.** See ROMAN CATHOLIC CHURCH.

**DUKE, HENRY E.** See GREAT BRITAIN, *Government*.

**DULUTH.** See CITY PLANNING.

**DUNCAN, LOUIS.** An American electrical engineer, died in Pelham Manor, N. Y., Feb. 13, 1916. Born in Washington, D. C., in 1862, and a graduate of the United States Naval Academy at 20, Mr. Duncan was sent by the government to Johns Hopkins for graduate work in physics, and especially in electricity (Ph.D., 1885). While there he determined the unit of electrical resistance. Resigning from the navy in 1887, he taught at Johns Hopkins thereafter till 1898, part of the time as associate professor of applied electricity. From 1902 to 1904 he was head of the department of electrical engineering in the Massachusetts Institute of Technology. Previously, during the Spanish-American War, he had served as major of the First Volunteer Engineers. As consulting engineer to the New York Rapid Transit Commission, Mr. Duncan was identified with the electrification of the transit systems of that city. Besides holding membership in foreign as well as American societies, Mr. Duncan served as president of the American Institute of Electrical Engineers from 1895 to 1897.

**DUNCAN, NORMAN.** An American story writer, died at Fredonia, N. Y., Oct. 18, 1916. He was born at Brantford, Ont., in 1871, and studied at Toronto University, but from 1895 he lived chiefly in the United States, first as a news-

paper man at Auburn, N. Y., then for four years (1897-1901) as a staff writer on the New York *Evening Post* (to which he contributed the stories of the Syrian quarter of New York that first brought him attention; they were collected as *The Soul of the Street*), later as a teacher. Until 1906 he was professor of rhetoric at Washington and Jefferson College, and from 1908 to 1910 adjunct professor of English literature at the University of Kansas. Mr. Duncan also traveled widely, serving as correspondent for *Harper's Magazine* in the Near and Far East. Previously, however, he had spent much time in Newfoundland and Labrador, and it is for stories of these regions, and especially of the sea-coast people, that he is best known. *The Way of the Sea* (1903), a collection, was followed by *Dr. Luke of the Labrador*, and *Dr. Grenfell's Parish*. Other books to be noted include: *The Mother*, *The Adventures of Billy Topsail*, *The Cruise of the Shining Light*, *Every Man for Himself*, *Going Down from Jerusalem*, *The Suitable Child*, *The Best of a Bad Job*, *A God in Israel*, *Australian Byways*, and *Billy Topsail, M. D.* The University of Pittsburgh gave him the degree of Litt.D. in 1912. Norman Duncan's home was at Willoughby, Ohio. At the time of his death he was visiting his brother.

**DUNKARDS, or DUNKERS.** See BRETHREN, CHURCH OF THE.

**DUNSANY, EDWARD J. M. D. PLUNKETT,** eighteenth Baron. See DRAMA, *passim*.

**DUTCH EAST INDIES.** Colonial possessions of the Netherlands, lying between Australia and the Asiatic continent. Capital, Batavia.

**AREA AND POPULATION.** Area and population, according to the census of 1905 (for the outposts approximate), of Java, Madoera, and the outpost provinces, are given in the table below. As officially estimated, Dec. 31, 1912, the population of Java and Madoera is given at 36,015,435, and the total population at 48,000,000. A new census will be taken in 1917.

	Sq. m.	Pop.
Java .....	48,686	28,604,719
Madoera .....	2,090	1,493,289
Outposts.		
Island of Sumatra:		
Sumatra, West Coast .....	31,788	.....
Padang Highlands .....	.....	403,431
Padang Lowlands .....	.....	905,040
Tapanoeli .....	.....	413,301
Benkoelen .....	9,437	204,269
Lampung Districts .....	11,338	156,518
Palembang .....	58,718	796,854
Sumatra, East Coast .....	35,481	568,417
Atjeh .....	20,550	582,175
Riouw * .....	16,379	112,216
Bangka .....	4,473	115,189
Billiton .....	1,869	36,858
Borneo, West District .....	56,061	450,929
Borneo, South and East Districts .....	157,587	782,726
Island of Celebes †		
Celebes .....	49,600	415,499
Menado .....	22,177	436,406
Amboina † .....	19,870	299,004
Ternate † .....	176,598	370,902
Timor .....	17,782	308,600
Bali and Lombok .....	4,063	523,535
Total .....	789,547	87,979,377

\* Consists of Indragiri in Sumatra and the Riouw and Lingga archipelagoes. † Included in Ternate are a part of eastern Celebes Island, Dutch New Guinea, and a part of the Moluccas; the rest of the Moluccas are in Amboina. Dutch New Guinea extends to 141 E., with estimated area 152,428 square miles and estimated population 262,000.

The population is legally separated into Europeans and those assimilated with Europeans.



Mme. Gabrielle Perrier and M. Paul Clergot in  
"PIERROT THE PRODIGAL"  
Winthrop Ames's Little Theatre, New York



Scene from Lord Dunsany's  
"THE GODS OF THE MOUNTAIN"  
Stuart Walker's Portmanteau Theatre, New York  
TWO NOTABLE PRODUCTIONS OF 1916



governed under Dutch laws; and natives, governed under Indian custom and tradition. The native population (exclusive of New Guinea) numbered 37,020,460 (Java and Madoera, 29,715,908); Europeans, 80,910; Chinese, 563,449; Arabs, 29,588; Orientals, other than natives, 22,970. Batavia had 138,551 inhabitants; Semarang, 96,600; Pekalongan, 41,719; Djokjarkarta, 118,378; Padang, 91,440; Palembang, 60,985; Bandjermasin, 16,708; Macassar, 26,145.

**PRODUCTION.** The colony provides a sufficient supply of food for a dense population, besides producing for export sugar, tobacco, tea, coffee, etc. The yield from sugar plantations in 1914 is quoted as 1,363,380 tons; coffee, 38,718 tons; cinchona, 739,532 kg.; tobacco, 5,351,628 kg. (19,933,225 kg. in 1913, and 23,096,387 kg. in 1911). Area (1912) under rice, 3,342,084 bahoes (1 baho = 1¼ acres); production, 85,514,914 piculs; sugar cane, 281,994 (sugar production, 21,562,047 piculs); tobacco, 262,736; indigo, 14,583; other cultures, 3,704,660. Government coffee plantations (Java), 50,526 bahoes (production, 81,000 piculs); production from emphyteutic lands, 272,000; from private estates, 29,000. Tobacco, 30,673,631 kg. in Java, and 19,965,896 in Sumatra. Tea (Java), 29,893,603 kg. in 1914; cacao, 1,186,282 kg. Tin from the mines at Banka, Billiton, and Riouw (1914-15), 20,526 tons. Coal production (1914), 609,888 tons. Petroleum, 1,564,927,000 kg.

**COMMERCE.** There is an import tax of 6 per cent on certain goods, and on a few articles, such as tobacco, a small export duty. Government and private trade, merchandise, and specie, are given for three years (in florins) below:

	1912	1913	1914
<b>Imports</b>			
Government:			
Merchandise . . . . .	20,229,755	27,021,000	28,485,297
Specie . . . . .	5,170,000	4,419,000	3,320,000
Private:			
Merchandise . . . . .	380,669,597	437,903,000	384,894,423
Specie . . . . .	29,553,007	28,998,000	13,459,091
<b>Total</b> . . . . .	<b>435,622,359</b>	<b>493,341,000</b>	<b>430,158,811</b>
<b>Exports</b>			
Government:			
Merchandise . . . . .	51,411,500	51,231,000	38,435,735
Specie . . . . .	609,072		
Private:			
Merchandise . . . . .	533,617,014	620,504,000	640,580,083
Specie . . . . .	1,410,614	6,211,000	5,539,171
<b>Total</b> . . . . .	<b>587,048,200</b>	<b>633,946,000</b>	<b>684,584,989</b>

Excepting rice, about half of which goes to Borneo and China, the majority of the exports go to the Netherlands. Steamers entered at the ports in the 1914 trade, 6147, of 4,604,546 tons, and 3531 sailing vessels, of 223,070.

Railways in operation (1914), 1727 miles; government telegraph and cable lines, 12,319 miles.

**FINANCE, ETC.** The 1916 budget estimated the revenue at 323,763,348 florins and the expenditure at 367,318,225 florins. The local revenue is derived from land, taxes on houses and estates, licenses, customs, etc., from government monopolies (salt, pawn shops, opium, railways), and sales of government products. The East Indies have been governed directly by the Netherlands since the dissolution in 1798 of the Dutch East India Company.

The Minister for the Colonies introduced in the Dutch Parliament on Sept. 1, 1916, a bill authorizing compulsory military service in the Dutch East Indies for both Europeans and natives.

**DUTCH GUIANA, or SURINAM.** A colony of the Netherlands (between 46,000 and 49,000 square miles) on the northern coast of South America. Population, Jan. 1, 1915 (exclusive of negroes in interior forests), 85,536. Sugar, molasses, rum, cacao, coffee, corn, rice, and gold are the principal exports. Total imports (1914), 6,309,849 florins; exports, 9,201,669 florins. Revenue and expenditure for 1916, 7,556,765 and 6,633,064 florins respectively; subvention, 923,701.

**DUTCH REFORMED CHURCH.** See REFORMED CHURCH IN AMERICA.

**DUTCH WEST INDIES.** See CURAÇAO.

**DWIGHT, TIMOTHY.** An American educator, died at New Haven, Conn., May 26, 1916. Of a famous old New England family, grandson and namesake of the eighth president of Yale College, Dr. Dwight was born at Norwich, Conn., in 1828 and graduated in 1849 from Yale. There he remained for several years, taking the degree of M.A. and studying at Yale Divinity School. To the latter institution he returned in 1858, after two years at the universities of Bonn and Berlin, to be until 1861 assistant professor, and thereafter till 1886 professor, of sacred literature and New Testament Greek. From 1886 till his retirement in 1899 he served as president of Yale, which became a university seven months after he took office, and which under his administration saw a remarkable development, gaining more in endowment, buildings, variety of courses, and enrollment than in any earlier period. Dr. Dwight was greatly beloved by Yale men. He had been ordained a Congregational minister in 1861, and most of his literary work was of religious character. Besides serving as a member of the American Committee for the revision of the English version of the Bible, he was an editor of the *New Englander* (later the *Yale Review*) and published various commentaries and a volume of sermons, *Thoughts of and for the Inner Life* (1899). He also wrote *Memories of Yale Life and Men* (1903).

**DYESTUFFS.** See CHEMISTRY, INDUSTRIAL.

**DYNAMO-ELECTRIC MACHINERY.** As was noted in the 1915 YEAR BOOK, the construction of still larger sizes of turbo-generators over those of the preceding year was a feature of 1916. Generators of 25,000 and 30,000 kilowatts capacity became rather commonplace, owing to the large number of them constructed, and machines of from 50,000 to 75,000 kilowatts were in contemplation. The largest generator built during the year was a 45,000-kilowatt machine, to furnish alternating current at 12,000 volts when running at 1200 revolutions per minute.

One of the most important developments of the year was the adoption of electric propulsion for many war vessels authorized for the United States navy. As mentioned in the 1915 YEAR BOOK, this system was decided upon after much investigation and observation of various types of generators and motors. Its advantages for naval purposes are reliability, ease of control, and saving of space.

The experience with "regenerative" control of electric motors obtained in actual service (see ELECTRIC RAILWAYS) brought out a number of

features of this system of great value to electrical engineers and railroad men, and marked a distinct advance in the art and practice of train operation.

**EAKINS, THOMAS.** An American artist, known both as a painter and as a sculptor, died on June 25, 1916. He was born in Philadelphia in 1844, and studied first at the Pennsylvania Academy. Afterward he was a pupil of Gérôme at the Beaux-Arts, Paris, and studied sculpture with Dumont. Eakins was long professor of painting in the Pennsylvania Academy, and he lectured also on anatomy in art schools. In 1902 he was elected a National Academician. He received awards at the Chicago, Paris, Buffalo, and St. Louis expositions; the Temple gold medal of the Pennsylvania Academy and the Proctor prize of the National Academy. Although he painted many figure studies, such as "Chess Players" (Metropolitan Museum) and "Cello Player," he is best known for his portraits, chief among which is "The Clinic of Professor Gross," owned by Jefferson Medical College, Philadelphia. He also painted Dr. Agnew in his clinic, and Cardinal Martinelli. Among his works of sculpture are two reliefs on the Trenton battle monument and horses on the Brooklyn soldiers' and sailors' monument.

**EARTH, ORIGIN OF THE.** See GEOLOGY.

**EARTH DAM.** See DAMS.

**EARTHQUAKES.** The record for 1916 included no individual disturbances noteworthy for the incidental damage done to life or property, comparable to the disastrous shocks that took place in the few preceding years. It was not, however, a period of seismic repose; the heavier shocks did not happen to be centred in populous areas and so accomplished no great amount of destruction. An example of the sort was the Alaskan earthquake which was transmitted all over the globe and belonged to the first order of magnitude, yet so far as known caused no loss of life. A rather heavy shock was felt in Northern Italy on August 16th, particularly in Rimini, Pesaro, and Ancona, where it destroyed a few buildings. Its epicentral area was farther north than that of the disastrous disturbance of Jan. 13, 1915. The instrumental study of earthquakes was continued with the usual vigor, adding many data to the store already accumulated, which in the course of time will serve as a basis for the development of more exact knowledge of the origin and transmission of seismic phenomena. It has been possible already to locate the principal zones of disturbance and to obtain a measure of the frequency of shocks that originate within them. The relation of earthquake occurrence to external influences is also a field of investigation which promises to yield important results for the future.

**EAST AFRICA PROTECTORATE.** A British dependency, lying between the Umba and Juba rivers and extending from German East Africa to Italian Somaliland and Abyssinia and inland to Uganda. Estimated area, about 200,000 square miles, inclusive of coast territory leased from the Sultan of Zanzibar. The population is estimated at about 4,000,000, including about 25,000 Asiatics and 3500 Europeans. Mombasa, the largest town and chief port, has a population of about 30,000 (250 Europeans). Nairobi (14,000 inhabitants, of whom about 800 are Europeans, and over 3000 Indians) is the administrative headquarters and the central station

of the Uganda Railway. Cattle, sheep, and ostriches are raised. The crops include grains, coconuts, cotton, sisal, rubber, tobacco, coffee, and fruits. The worked mines yield carbonate of soda, limestone, graphite, and gold. The telegraph system, exclusive of the lines in Uganda, has 2302 miles of line (the railway line has three wires). Commercial and financial figures follow:

	1909-10	1910-11	1913-14	1914-15
Imports ...	2775,246	21,000,846	22,147,937	21,469,210
Exports ...	590,057	962,911	1,482,876	1,004,756
Revenue ...	503,039	609,585	1,123,789	984,756
Expenditure ...	669,404	682,041	1,115,899	1,151,730
Gr't-in-aid ...	133,500	150,000	.....	.....
Shipping* ...	1,914,153	1,864,740	1,791,081	.....

\* Tonnage entered at Mombasa and Kilindini.

The import figures are exclusive of railway material, government stores, and specie. The Uganda (Mombasa-Victoria) Railway is worked as a state line of the East African Protectorate. Its length is 618 miles, with a gauge of one meter.

**EBNER-ESCHENBACH, MARIE, BARONESS VON.** An Austrian author, whose death in Vienna was announced March 14, 1916. She was born in 1830 at Castle Zdislawitz, Moravia, as Countess Dubsky. Baron Ebner-Eschenbach, to whom she was married in 1848, was an Austrian officer. Her writings, especially her novels, are notable in content and style. She is less well known for plays, a collection of aphorisms, and verse. Between 1893 and 1911 her works were published in a collected edition. Several were translated into English. Among more than a score of titles, are: *Erzählungen* (1875); *Ein kleiner Roman* (1889); *Glaubenslos* (1893); *Agave* (1903); *Genrebilder* (1910).

**ECHEGARAY, JOSÉ** (full name ECHEGARAY Y EIZAGUIRRE). A famous Spanish dramatist, also a mathematician and statesman, died Sept. 14, 1916, at Madrid. In the same city he was born April 19, 1832. Graduating at the head of his class of engineers in the Escuela da Caminos, Canales, y Puertos, Madrid, at the age of 20, he was appointed engineer of the second class the next year and was sent to Almería (Granada). He devoted himself to mathematics and by 1854 had become professor of that subject at the Escuela da Caminos, serving also for a few years as secretary of the institution. A book that he wrote on problems of analytical geometry brought him election to the Royal Academy of Sciences when he was only 32. He took his seat the next year (March 11, 1866), on the fiftieth anniversary of which occasion (1916) the King presented to him a special medal of the Academy. In 1869 he was appointed Deputy to the Constituent Cortes, and sat for the Asturian district. His conspicuous talents for public life were recognized from the first. In the very year of his entering the Cortes he was appointed Minister of Public Works, an office that he held till 1871 and again in 1872. In 1872-73 and in 1874 he served as Minister of Finance and after another term (1904-06) at this post became Life Senator and president of the Council of Public Instruction.

His first plays, *El libro talonario* and *La esposa del vengador*, were both published in 1874. They marked the beginning of a remarkable literary career, during which the dramatist pro-



duced some 70 plays, in prose or verse. Eche-garay came to be recognized as the leader and chief pride of a new movement in Spanish drama, an epoch rather than a movement. His greatest work is *El gran Galeoto* (1881), a powerful presentment of the evil done by slander. It has been translated (several times) into English as *The Great Galeoto*, and was produced on the American stage by Mr. and Mrs. William Faversham under the title *The World and His Wife*. Others of his plays to be had in English are: *The Son of Don Juan* (1895), *The Madman Divine* (*Poet Lore*, 1908), *Madman or Saint* (*Poet Lore*, 1912), *Mariana* (1914), and *Always Ridiculous* (1916). With Mistral, Eche-garay shared the Nobel prize in literature for 1904. Consult L. Antón del Olmet and A. García Carraffa, *Echegaray* (Madrid, 1912).

**ECHEGARAY, MIGUEL.** See SPANISH LITERATURE.

**ECLIPSE.** See ASTRONOMY.

**ECONOMIC ASSOCIATION, AMERICAN.** At the same time as the meetings of the American Sociological Society, the American Statistical Association, and the American Association for Labor Legislation, the American Economic Association held its 29th annual meeting at Columbus, Ohio, Dec. 27-30, 1916. The four associations met jointly for one session and later in various combinations. Papers were read by distinguished economists, including Richard T. Ely, Henry C. Taylor, Paul L. Vogt, Allyn A. Young, O. M. W. Sprague, J. E. LeRossignol, and others. An especially important feature was a discussion of economic problems likely to arise in the United States at the close of the European war. Topics for consideration included the gold supplies, immigration, the attitude of governments toward industry, and the redistribution of labor. The association has about twenty-five hundred members, many of whom are not professional economists, but are persons interested in economic questions. President, Thomas N. Carver; secretary, Allyn A. Young.

**ECONOMICS, SOCIAL.** See SOCIAL ECONOMICS.

**ECUADOR.** A South American republic lying between Colombia on the north and Peru on the south, and on the west bordering the Pacific. The capital is Quito.

**AREA AND POPULATION.** Pending the final establishment of boundaries hitherto in dispute, the area of Ecuador may be stated at 299,600 square kilometers (115,676 square miles); or, including the Galápagos (about 730 miles off the coast), 307,243 square kilometers (118,627 square miles). The population was estimated in 1910 at 1,500,000. The proportion of pure white inhabitants is very small; mestizos number perhaps 400,000, while the great majority of the people are Indian. Guayaquil, by far the most important seaport, is supposed to have over 80,000 inhabitants; Quito, about 75,000; Cuenca, over 40,000; Ríobamba, 20,000; Ambato, Loja, and Latacunga, about 12,000 each; Bahía de Caraquez, Ibarra, and Puertoviejo, about 10,000 each; Esmeraldas, 5,000.

**EDUCATION.** Primary instruction is free and nominally compulsory, but illiteracy is prevalent. According to a report of the minister of public instruction, there were in 1916 1114 government elementary schools, 151 municipal schools, and 135 private schools; the total enrollment in these schools was 97,395. For secondary education

there are 35 schools, besides 9 government higher schools and commercial and technical schools at Quito and Guayaquil. The Central University at Quito has faculties of science, jurisprudence, medicine, and pharmacy; the Azuay University at Cuenca and the Guayas University at Guayaquil have faculties of jurisprudence, medicine, and pharmacy. There is a college of jurisprudence at Loja. The state religion is Roman Catholicism. Civil marriage was made obligatory by a law of 1902.

**PRODUCTION AND COMMERCE.** Agriculture is the country's chief source of wealth. Valuable minerals exist, but have not been largely exploited. Ecuadorian manufactures are of little commercial importance, except Panama hats, which are produced in large numbers. The most important crop is cacao, for which Ecuador supplies a large part of the world's demand, though the proportion is smaller than formerly; the average output of the country has not declined, but the production in other tropical regions, as Eastern Brazil, the Dominican Republic, and São Thomé, has in recent years increased. The Ecuadorian cacao is grown in the coastal regions; the 1914 production was reported at about 92,214,000 pounds. Other products of some importance are coffee, ivory, nuts, rubber, sugar cane, and tobacco. The rubber industry has suffered from the thriftless exploitation of the trees.

For the 1915 foreign trade only approximate figures are available; the imports have been reported at 26,000,000 sucres and the exports at 34,000,000 sucres. In 1914, imports and exports were valued at 17,289,644 and 26,875,650 sucres respectively, as compared with 18,182,488 and 32,488,410 sucres in 1913. Import and export values (with the sucre at 48.6 cents) are shown below in thousands of dollars:

	1910	1911	1912	1913	1914
Imports . . . .	8,008	11,489	10,855	8,887	8,408
Exports . . . .	13,688	12,692	18,690	15,789	18,062

The principal imports are cotton and woolen fabrics, foodstuffs, hardware, machinery, wines and liquors, ready-made clothing, etc. By far the most important export is cacao; this amounted in 1913 to 41,869 metric tons, valued at 20,524,340 sucres; in 1914, 47,210 tons, 20,769,322 sucres; in 1915, 37,019 tons, 19,938,092 sucres. Normally France takes about one-half and the United States about one-fourth of the cacao export. The export of Panama hats in 1914 was valued at 2,000,000 sucres. The coffee export amounted to 3686 metric tons in 1913 and to 2980 metric tons, valued at 1,212,000 sucres, in 1914; ivory nuts, 31,684 tons in 1913 and 8583 tons, valued at 944,000 sucres in 1914. Export of gold in 1914, 752,000 sucres; hides, 480,158; rubber, 185,457. Trade by principal countries, in thousands of dollars:

	Imports		Exports	
	1913	1914	1913	1914
United States . . . . .	2,818	2,771	3,884	3,588
United Kingdom . . . . .	2,618	2,415	1,620	1,281
Germany . . . . .	1,568	1,204	2,627	860
Italy . . . . .	296	389	336	288
Spain . . . . .	286	365	670	628
France . . . . .	485	327	5,882	4,488
Netherlands . . . . .	0	60	256	1,018
Total, including others.	8,887	8,408	15,789	18,062

**COMMUNICATIONS.** Communication and transportation facilities are very inadequate. For the most part the roads are simply bridle paths. There are in operation about 400 miles (about 650 kilometers) of railway; of this, 297 miles are comprised in the line from Durán (opposite Guayaquil) to Quito. This line, opened in June, 1908, has failed to earn interest on its bonds and has been operated at a heavy loss.

During 1916 the Congress authorized the construction of a railroad from Chone to Quito, passing through Santo Domingo de los Colorados. This road was to connect Quito with the ports of Manta and Bahía de Caraquez on the central western coast of Ecuador, and a part of the customs duties collected at these ports will be used for the construction of the road, in addition to other funds including the proceeds of loans raised both abroad and at home. Other legislation provided for a new railway from San Lorenzo del Pailon, or some other accessible port in the Province of Esmeraldas, to Ibarra. This project, however, was not to affect the construction of the line from Quito to Ibarra, which would connect at Ibarra with the railway from the port. An appropriation was also made for a branch road from Ibarra to Tulcan on the completion of the road from Quito to Esmeraldas.

The aggregate length of telegraph lines is reported at about 3500 miles. Radiotelegraph has been installed. Post offices, 168.

**FINANCE.** The standard of value is gold. The monetary unit is the sucre; its par value is 48.665 cents, being one-tenth of a pound sterling. Revenue and expenditure in 1914 are reported at 16,913,787 and 20,220,794 sucres respectively. The revenue consisted of import duties 7,707,191 sucres, export duties 3,806,981, and taxes 5,399,615. The revenue for 1916 was estimated at 15,536,327 sucres. The public debt was stated in 1916 at 43,142,392 sucres, of which about 32,000,000 sucres comprised the foreign debt.

**GOVERNMENT.** The executive authority is vested in a president, elected by direct vote for four years; he is ineligible for reelection until after a lapse of two terms. He is assisted by a cabinet of five members. The legislative power is exercised by a congress of two houses, the Senate and the Chamber of Deputies. Senators (32 in number) are elected for four years and deputies (48) for two years, all by direct vote. The franchise is held by male citizens over 21 years of age and able to read and write. For the term beginning Aug. 31, 1911, Emilio Estrada was inaugurated president in succession to Gen. Eloy Alfaro. The death of Estrada, Dec. 21, 1911, was followed by an insurrection headed apparently by friends of Alfaro (who was killed). On March 31, 1912, Gen. Leonidas Plaza Gutiérrez, commander of the government forces, was elected President, and on the 31st of August following was inaugurated for a four-year term. General Plaza had been President in 1901-05. He was succeeded in 1916, for the term 1916-20, by Alfredo Baquerizo Moreno, who was elected January 12th and had been minister for foreign affairs and president of the Senate. The election was accompanied by serious disorders. One of the first acts of the new government was the promulgation of an eight-hour-day law, with 25 per cent extra pay for overtime work, 15 days' annual vacation, and 60 days' sick leave with pay.

**ECZEMA.** See ANAPHYLAXIS.

**EDGE, WALTER E.** Elected Republican Governor of New Jersey, Nov. 7, 1916.

**EDUCATION.** See section so entitled under various foreign countries and under States of the United States; also EDUCATION IN THE UNITED STATES; MODERN SCHOOL, THE; UNIVERSITIES AND COLLEGES.

**EDUCATIONAL BUILDINGS.** See ARCHITECTURE.

**EDUCATION IN THE UNITED STATES.**

**STATISTICS.** *Attendance in Elementary and Secondary Schools.* Owing to the fact that it has been impossible for the United States Bureau of Education to collect and to compile the statistics in time to submit them to the printer on the date set by Congress, complete information concerning the statistics for the year 1914 cannot be presented. A brief summary issued by the Bureau of Education contains the following estimates. It is estimated that 23,500,000 attended schools of some kind in the United States in 1916. This is approximately 24 per cent of the population, as compared with 19 per cent in Great Britain, 17 per cent in France, 20 per cent in Germany, a little over 4 per cent in Russia. The number of pupils in public kindergartens and elementary schools in 1914 was 17,500,000, an increase of more than a million in four years. The number of high school students was 1,219,000. There were 706,000 teachers. Of this number 169,000 were men. The report shows that the number of men teachers has increased somewhat since 1900, while the number of women teachers is almost doubled. In 1900 positions in public high schools were evenly divided between men and women. At present the women outnumber the men by 8000. The average annual salary of all teachers is \$525. The figures are highest in the East and North Atlantic States, with \$699 and \$696 respectively, and lowest in the South Atlantic States with \$329. The average salaries vary from \$234 in Mississippi to \$941 in New York.

*Cost of Education.* The estimated cost of education in 1914 was about \$800,000,000. It is estimated that the cost for 1916 was no less than \$1,000,000,000. In 1915 public elementary schools cost approximately \$500,000,000, public high schools \$70,000,000, private elementary schools \$52,000,000, private secondary schools \$15,000,000. For the year 1914 \$555,077,146 was reported as spent for public schools. New York, with an expenditure of \$66,000,000, ranks first in the total amount expended. On a per capita basis Utah ranks highest, with an expenditure for education of \$10.07.

**THE GARY PLAN.** The system of school administration developed by Supt. William A. Wirt at Gary, Ind., has received a great amount of attention during the past year. During 1915 Superintendent Wirt was employed as a consulting expert by the New York City Board of Estimate. He was required to devote one week each month to this work and he received \$10,000. He was retained during the year 1916 on the same terms. New York City organized several of its schools in accordance with Mr. Wirt's plan. This brought about a lively discussion as to the value of the scheme. Some of the superintendents and principals have bitterly opposed the extension of this form of organization. The Public Education Association of New York City has urged that the plan be given a fair trial. It has seemed so important that the General Education

Board has undertaken a thorough investigation of the schools at Gary, and for this purpose some of the most competent men in the country have been employed. Briefly stated, Mr. Wirt proposes to use the entire school equipment all the time. He accomplishes this through what may be called the "two-school plan." The activities of the school are divided into four departments. One department deals with the work ordinarily conducted in the classrooms, another with such activities as are conducted in shops, laboratories, and studios, another with mass instruction conducted in the auditorium, and another with such activities as may be conducted in gymnasiums, playgrounds, and playrooms.

**THE HENRY CLAY FRICK EDUCATIONAL COMMISSION OF THE CITY OF PITTSBURGH.** During the summer of 1916 announcement was made that Mr. Henry Clay Frick had added \$250,000 to his original gift of the same amount for the purpose of assisting the teachers of Pittsburgh in conducting professional work. Several thousand teachers of that city have already availed themselves of the opportunities offered by the first gift. Dr. John A. Brashear has been the custodian of the fund, but the name of the donor was secret until Mr. Frick was persuaded to allow his name to be made public.

**EDUCATIONAL INVESTIGATIONS AND SURVEYS. Buffalo, N. Y.** Upon the request of the Superintendent of Public Instruction for Buffalo, the New York State Department of Education made a careful examination of the whole educational system in Buffalo. Dr. Thomas E. Finnegan, Assistant Commissioner for Elementary Education, took charge of the work and employed members of the official staff of the department as his assistants. Each of ten men spent about fourteen weeks in examining the schools. The report issued by the Education Department of the State of New York consists of seven chapters and an appendix. It calls attention first to the system of organization in operation before 1916. For many years the city had no board of education. The common council had the general power to control and regulate the school system of the city. The superintendent of schools was elected by popular vote. The new Buffalo charter, which went into operation on Jan. 1, 1916, provided for a board of education, but the report criticises the provisions of this charter in that the council is still authorized to determine the period and the conditions of appointment of teachers and the salaries to be paid, to determine the courses of study, to appoint members of the board of education and the superintendent of education, and to remove members of the board, the superintendent, or other officers employed in the administration of the school. The report criticises somewhat severely the quality of instruction and the character of supervision. It discusses in detail the teaching of the various subjects in the elementary and high schools and offers many constructive suggestions.

**Los Angeles, Cal.** The Los Angeles Board of Education appointed a commission consisting of Albert Shields of New York City, F. J. Robbitt of the University of Chicago, and W. A. Jessupp of the University of Iowa, to report on the future policy of the schools. This report was submitted during the summer months and Mr. Shields was appointed superintendent of schools.

**Maryland.** The Legislature of Maryland passed an act in 1914 containing the following statement:

"It is the desire of the General Assembly that there be made a comprehensive study of the public school system of the State of Maryland, and of the State-aided elementary and secondary schools and the higher educational institutions of the State of Maryland, with a view to correlating and coördinating the different institutions wholly or partially supported by State appropriations."

The Legislature appropriated \$5000 to carry out the act. The commission appointed by the Governor requested the General Education Board to undertake the survey. The report of the commission was submitted to the Governor on Dec. 20, 1915, and many of the recommendations were incorporated in the new school laws passed by the Legislature of 1916. The report says: "Public Education in Maryland is on the whole soundly organized. Further, the State deals generally with the public schools in the matter of money. We do not propose, therefore, any fundamental change in the general structure of the public school system of Maryland nor do we suggest that the State increase at all its appropriation to the schools." The report criticizes the county superintendency, in that the superintendent was not required to be trained or to be an experienced schoolman. The commission found that the State's general school fund was distributed almost unconditionally. The counties got their quota whether they did their educational duty or not. It states that "public education in Maryland is in politics." The teaching force was not thoroughly trained. Among other things, it recommends a revision of the law dealing with the certification of high school teachers and the enactment of a State-wide compulsory education law. It also recommends that "the State contribution should in future be paid to no county which does not levy for educational purposes a minimum tax fixed by the Legislature. The more progressive counties will, of course, continue to levy more, as they do now."

**St. Louis, Mo.** St. Louis, in common with most other large cities, has reached a point where it is difficult to secure sufficient funds for the support of the various departments. As regards the schools the city authorities believed that it was necessary either to reduce the cost of instruction or to issue bonds for the construction of new buildings. The latter alternative was the one agreed upon by the board. Before it was finally decided, however, it was determined to make a survey of the school system in order to assure the citizens that there was a need of funds. The survey, therefore, did not originate in any dissatisfaction with the school but was undertaken for the definite purpose of assisting in securing a bond issue. The school board appropriated \$10,000 for a survey and Prof. Charles Hubbard Judd, Director of the School of Education at the University of Chicago, was given charge. Dr. Judd associated with himself a staff of specialists and every phase of education in the city was examined and as far as possible tested.

**San Francisco, Cal.** The United States Commissioner of Education accepted an invitation to survey the schools of San Francisco. In addition to specialists from the Bureau of Edu-

cation, Commissioner Claxton employed Prof. John W. Withers of St. Louis, Prof. Charles McMurry of Peabody College for Teachers, Prof. J. Stanley Brown of Joliet, and Prof. F. B. Dressler of Peabody College for Teachers.

**MILITARY TRAINING IN SCHOOLS.** The Legislatures of several States considered the advisability of introducing military training in the public schools. The most important legislation on this subject occurred in New York. The Welsh-Slater law created a State Military Training Commission consisting of three members. The Major-General of the National Guard of the State is the chairman of the commission. The Board of Regents was given authority to appoint a member and the Governor appointed the third member. This commission, consisting of John F. O'Ryan, Major General, Dr. John H. Finley, Commissioner of Education, and George J. Fisher, M.D., Secretary of Physical Department, International Committee of Y. M. C. A., has recommended to the Board of Regents of the State of New York a programme of physical training for elementary and secondary schools. Commissioner Finley has issued the following statement regarding the work to be accomplished:

"In accordance with the law with the beginning of the school year this fall every elementary school in the State, public and private, must provide for every pupil over eight years of age a physical training course to consist of setting-up exercises and gymnastic drills or supervised recreation. This programme makes compulsory for the present year the minimum time prescribed by the act, twenty minutes a day or one hundred minutes a week for every school child.

"The setting-up exercises consist of drill of at least two minutes' duration at the beginning of each class hour, or a minimum of four times in each school day. Boys are to be grouped on one side of the room and girls on the other. Capable pupils will be selected as leaders. Variations are to be introduced at intervals and emphasis is to be laid on posture, through postural exercises; discipline, through orderly response to commands; and health, through exercise of large muscle groups, breathing exercises, and the habit of exercise. The syllabus for this work is being prepared by the board of regents, and will be in the hands of the superintendents and principals by October 1st.

"If there are facilities in the school, gymnastic drill is to be given sixty minutes a week, preferably in two periods of thirty minutes each, under a special teacher of physical training. The regulations point out that this is to be sixty minutes of actual work on the floor, not to include time spent in preparation for exercises or for return to a following recitation.

"In schools where gymnastic drills cannot be given, supervised recreation for a like time, sixty minutes a week, is to be substituted under the regular class teacher or special teacher or both. The minimum of sixty minutes a week may be covered in recess periods or in the regular schedule or after the work of the day in other subjects has been finished." See also **MODERN SCHOOL, THE.**

**MORAL OR CHARACTER EDUCATION.** The question of teaching morals or developing the proper character in children and youth has taken definite form in a National Morality Codes com-

petition. An American business man through the National Institution for Moral Instruction has offered a \$5000 prize for the best code of morals suitable for use by parents and teachers in the moral or character education of children in American schools and homes. The purpose of the competition is to determine intelligent public opinion as to what ideas regarding morality and character should be taught in American schools and homes. Seventy of the foremost educators of the country have been enlisted in this competition. This effort represents the most direct and feasible attempt to determine the subject matter of moral instruction that has been made in this country.

**EGGS.** See **FOOD AND NUTRITION; PRICES.**

**EGYPT.** A British protectorate by proclamation of Dec. 18, 1914; lying in the northwestern part of Africa, between 22° and 31° 35' N. lat., and 16° and 37° E. long.

**AREA AND POPULATION.** The area, exclusive of the Sudan, is given as 363,181 square miles, of which only 12,013 square miles are settled and under cultivation. The population in 1907 numbered 11,189,978, not including nomadic Bedouins, estimated to number over 97,000. Of the total population 5,667,974 were males, 5,620,285 females. The census of 1846 returned a population of 4,476,440; that of 1882, 6,831,131; that of 1897, 9,734,405. The estimated population in 1914 of Cairo was 726,075; Alexandria, 413,611; Tanta, 57,623; Port Said, 58,804; Mehala el Kobra, 47,955; Mansura, 44,273; Assiut, 42,751; Damanhur, 38,752; Fayum, 40,499; Zagazig, 38,152; Damietta, 35,407; Minieh, 27,221.

**EDUCATION.** Primary instruction is given in the *maktabs*, or elementary vernacular schools, some under native management and some under the control of the ministry of education. The ministry still retains, under its direct control, certain elementary schools belonging to trusts controlled by the ministry of *Waqis* (pious foundations); these *maktabs* numbered 142 at the end of 1913, with an attendance of 14,027. Higher primary schools, 34, with 7610 pupils; provincial council *maktabs*, 911, with 57,175; private *maktabs* (grant-in-aid), 3394, with 174,282; provincial council high primary schools, 78, with 10,493. Total number of establishments under direct management of the ministry of education, 198, with 27,864 pupils; total number of establishments under inspection by the ministry, 4493, with 253,295 pupils. Of the latter total, 227,434 were boys and 25,861 were girls. A free primary schools has been established in Cairo. There are also government secondary, special, and technical schools and colleges of law, medicine, education, and engineering. A national university under exclusively Egyptian management has been founded at the capital.

**PRODUCTION.** The total area of Egypt is estimated at 232,440,000 statute acres, of which about 7,000,000 acres are formed of the alluvium brought down by the Nile from the Abyssinian hills, the remainder being chiefly limestone desert. Such portions of the alluvial tracts as can be irrigated by the Nile (about 5½ million acres in 1912) are cultivable, irrigation being employed for this purpose on (a) the basin system, the land being divided into rectangular areas of varying size and surrounded by banks, between which the waters of the Nile are admitted during the flood season (August), and there retained for about 40 days, when they are run

off and seed is sown broadcast on the land; and (b) the perennial system, consisting of deep canals containing water all the year round and enabling two or more crops to be grown. For irrigation purposes barrages have been built at Fana and Assiut, and others in the Nile delta have been restored and improved; while a storage dam has been constructed at Assuan, and a barrage built at Zifta. The increase in the value of the land owing to these labors is enormous, and some 2,000,000 acres have been added to the cultivable area.

The crops include wheat, barley, corn (autumn and summer), rice (autumn and summer), and beans; while cotton of excellent quality is grown, the crop in 1914-15 being 7,610,000 *kantars* (99 lbs.). Clover, sugar-cane, and onions are also largely grown, and there are some 30,000 acres of orchards and market gardens. The live stock included 601,136 cattle, 568,388 buffaloes, 39,824 horses, 22,475 mules, and 632,436 donkeys.

**COMMERCE.** By decision of the president of the Council of Ministers dated Aug. 2, 1914, the export of foodstuffs and products (except for necessary supplies to outward-bound ships) has been prohibited since August 3rd. By similar decision dated Oct. 18, 1914: (1) Dealers in rice have been authorized to export all their 1913 stock of Baladi rice. (2) If rice is imported, export from the stock existing in Egypt is authorized up to 50 per cent of the amount imported, to take effect from Sept. 25, 1914. By ministerial decision of October 25th the export of 280,000 quintals of corn has been authorized. By a ministerial decision of April 20, 1915, the export of corn has been permitted without restriction and the same for wheat. The export of raw cotton is prohibited to all ports in Europe and on the Mediterranean and Black seas, other than those of Great Britain and Ireland, France, Russia (except Baltic ports), Spain, and Portugal. The export of cotton to Switzerland and to Greece is permitted until further orders. All cotton so exported must be consigned for Switzerland to the *Société Suisse de Surveillance Economique*, and under recommendation from the British minister at Athens, if for Greece. The export of rice is now prohibited to all destinations. By decision of the Council of Ministers of Sept. 12, 1916, the authorizations for exports of corn and wheat without restriction were canceled. Consequently these articles again come under the general prohibition imposed by the decision of August, 1914.

In the table below are given imports and exports of merchandise in thousands of pounds Egyptian:

	1911	1912	1913	1914	1915
Imports ...	27,227	25,908	27,865	21,725	19,329
Exports ...	28,599	84,574	31,662	24,092	27,047

A table of principal articles of trade, values in thousands of pounds Egyptian for 1915, follows:

Imports	1000 £E	Exports	1000 £E
Textiles .....	5,685	Textiles .....	19,414
Fuel .....	2,561	Cereals, etc. ....	4,619
Spirits, etc. ....	1,621	Metals, etc. ....	763
Cereals, etc. ....	1,583	Animal prods. ....	587
Drugs, etc. ....	1,382	Tobacco .....	249
Chem. prods. ....	1,291	Drugs .....	599
Animals, etc. ....	1,157	Skins, etc. ....	304

Trade with the principal countries of origin and destination is shown in the following table, in thousands of pounds Egyptian (£E = \$4.943);

	1911	1912	1913	1914	1915
<b>Imports:</b>					
United Kingdom.	8,557	7,991	8,496	7,061	8,789
British pos.* ...	257	253	207	192	270
British pos.†....	1,095	1,314	1,762	1,277	1,905
France ‡ .....	2,889	2,411	2,513	1,640	984
Turkey .....	2,808	2,754	2,724	1,911	171
Austria-Hungary ..	1,988	1,680	1,941	1,127	8
Germany .....	1,500	1,421	1,609	1,875	29
Italy .....	1,461	1,248	1,473	1,450	1,614
<b>Exports:</b>					
United Kingdom.	13,958	16,022	13,648	10,450	13,936
British pos.*....	10	14	13	66	232
British pos.†....	111	118	103	168	294
France ‡ .....	2,316	2,707	2,787	1,571	1,506
Austria-Hungary..	1,448	1,431	1,757	960	....
Germany .....	3,117	3,886	4,066	2,299	....
United States....	2,071	4,121	2,485	2,917	4,961
Russia .....	1,789	2,056	2,242	1,600	1,078

\* British possessions in the Mediterranean. † British possessions in the Far East. ‡ Including Algeria.

Steamers entered at Alexandria in the 1915 trade, 958, of 1,576,756 net registered tons; cleared, 989 steamers, of 1,682,869.

**COMMUNICATIONS.** There were 1567 miles of state railway in operation March 31, 1915. In addition there were 816 miles of light railways—the Egyptian Delta Light Railways, the Chemins de Fer de la Basse-Egypte, and the Fayum Light Railway.

**FINANCE.** The budget for 1915-16 was estimated to balance at £E15,900,000. Revenue and expenditure for three years are shown in the table below:

	1912	1913	1914-15
Revenue ..£E	17,515,748	£E 17,368,616	£E 15,390,818
Expend. .	15,470,584	15,728,785	16,857,783

The total outstanding debt Jan. 1, 1915, amounted to £E94,028,840, and the annual charge for interest and sinking fund to £E3,551,266.

**GOVERNMENT.** Hussein Kemal Pasha, with the revived title Sultan of Egypt, is the reigning monarch. Sir Arthur Henry McMahon was appointed high commissioner for Egypt. Governor-general, Sir Reginald Wingate.

**HISTORY.** On March 20th, it was announced that an agreement had been reached between the British and Italian governments on various questions, especially those which concerned Italy's representation in the Mixed Courts and the status of Italian subjects. The British government had declared its recognition of Italian interests in Egypt, and its acceptance of the principle of equality in the treatment of Italian colonials and the colonials of other powers. The agreement relieved the Italian colony of certain technical disqualifications and as a result improved the relations between the Italian and British governments. It also raised the question whether the time would not soon come for the removal of that burdensome treaty known as the Capitulations, which pertained to Turkish sovereignty, and which on the downfall of the Turkish power seemed no longer necessary. It had been supposed that after the failure of the Dardanelles campaign, the Turkish forces thus set free would attack Egypt, but there was no serious invasion, although the hinterland of Western Egypt was overrun by Mohammedan tribesmen. In the Sudan for some time past

there had been disaffection in the portion of the Sudan under the Sultan of Darfur. In February he began to gather forces near the Kordofan frontier. A British force was assembled by Colonel Kelly, and advanced against the enemy on May 15th. On the 25th the British were reported to have defeated the Sultan's forces and the Sultan was said to have fled. See also ARCHÆOLOGY.

**EIGHT-HOUR DAY.** See LABOR.

**ELECTION LAWS.** See ELECTORAL REFORM.

**ELECTORAL REFORM.** The fact that but few of the State legislatures were in session in 1916 accounts for the comparatively small number of measures passed affecting the electorate. Even those legislatures which did have sessions did not pass many measures of the first importance.

As the so-called "grandfather" clause in the Oklahoma Constitution was pronounced unconstitutional by the United States Supreme Court in 1916 the Legislature of 1916 proposed a new amendment changing the description of the persons excepted from the literacy test to those who have seen military or naval service, including service in any foreign nation, and their descendants. This varied the usual "grandfather" clause, which confined the ballot to the military and their descendants. The New Jersey Legislature passed a measure requiring registration in person or by affidavit, in municipalities of more than 10,000. The provision for registration by affidavit was new, and provides for persons prevented by illness or absence from the State from registering in person.

Absentee voting was provided for in Oklahoma and Virginia. In Oklahoma voting in another precinct by a vote absent from his own county is permitted, and in Virginia absent voters may vote by registered mail. The Massachusetts Legislature regulated the primary ballot arrangement of candidates for delegates to national conventions. Preference for President must be entered on the ballot if declared by candidates, and consented to by the person preferred. This consent may be communicated by telegram or cable. The Massachusetts Legislature also repealed, subject to referendum, the 1914 law authorizing a single ballot for all parties to primary elections, and restored the 1913 requirement of separate ballots to each party. The California Legislature at a special session amended the direct primary and presidential primary laws. The previous law provided for registration without declaration of party affiliation, but that act was refused by the voters on referendum. The amendment of 1916 provided for a declaration of party affiliation at the time of voting at a primary election instead of at the time of registration. The Legislature of Maryland amended the election law so as to abolish what is known as the "envelope" system of voting at primary elections. The Legislature of South Dakota in special session amended the primary law. It advanced the date fixed by the law of 1915 for the general primary to obviate the necessity of two primaries in the presidential year, one for State officers, and the other for national conventions. The law also contains new provisions as to nominating delegates and expressing preference for President. The Legislature of Louisiana enacted a primary law providing that all party candidates for State or local

offices, including United States Senator and Congressmen, shall be nominated by direct primary, and a general election dealing with nominations, ballots, etc. The Kentucky Legislature enacted a corrupt practices act, prohibiting corporation contributions to and limiting amounts of campaign expenses and annulling elections in certain cases of violation.

**INITIATIVE, REFERENDUM, AND RECALL.** The Oklahoma initiative and referendum law was amended in respect to the distribution of publicity pamphlets. If public officers fail to print and distribute the required pamphlets an elector may petition to the court to mandamus, but failure to print and distribute such pamphlets is not to invalidate any election. In Mississippi a constitutional amendment adopted in 1914 authorizing the initiative and referendum was put into effect. This amendment applies to constitutional amendments as well as statutes.

**STATE CONSTITUTIONS.** The Massachusetts Legislature submitted to the general election in 1916 the question of calling a constitutional convention. The resolution calls for the election of 320 delegates to be elected on the first Tuesday of May, 1917, and a meeting of the convention on the first Tuesday of April following. Nomination and election by delegates must be non-partisan ballots.

**CORRUPT PRACTICES.** A strict corrupt practices bill was introduced in the Senate by Senator Owen of Oklahoma and was taken up on September 6th, after an unusually bitter and violent debate. The Republican leaders objected to the consideration of the bill at that time, but it was finally voted to consider it. The bill, which was a substitute for a similar measure passed by the House, limits the total amount to be expended by national campaign committees to \$400,000. Individual contributions are limited to \$5000. The bill prohibits the buying of votes by direct or indirect means. It forbids all contributions by corporations for political purposes, and imposes heavy penalties for violation of the law. The general purpose of the measure is to strengthen the present law relating to corrupt practices, which is considered weak in its limitations on the use of money in elections. The Senate adjourned without taking final action on the measure. See UNITED STATES, *Presidential Campaign*.

**ELECTRICAL INDUSTRIES.** These industries in 1916 in the United States shared in the activity and prosperity common to most fields of commerce and manufacturing. Conditions created by the war and causing a demand for products that had formerly been largely imported into the United States led to the development and improvement of many electro-chemical processes. T. C. Martin, whose annual table of statistics for the electrical industry is so well known, gives the accompanying tabulation as representing approximately the gross earnings of the chief electrical enterprises during the year:

Telegraphy—all kinds .....	\$150,000,000
Telephony .....	400,000,000
Central stations .....	500,000,000
Electric railways .....	750,000,000
Isolated plants .....	150,000,000
Electrical manufacturing .....	550,000,000
Miscellaneous .....	125,000,000
<b>Total .....</b>	<b>\$2,625,000,000</b>

In the line of manufactures it was estimated that 1916 experienced a total value of electrical goods of all kinds equal to \$500,000,000—a large increase over 1915. Exports of electrical material were also very large, totaling not less than \$35,000,000.

Conservative estimates of the amount of business done by the three great electrical manufacturing companies in the United States indicated that up to December 31st, the General Electric Company had a total volume of sales equal to \$150,000,000; the Westinghouse Company and the Western Electric Company had each gross sales of \$100,000,000, and the latter reported that at the end of the year unfilled orders on its books would amount to almost \$125,000,000.

In addition to the use of electric power in new industries owing to the war, there was a great increase in its application to steel furnaces. (See METALLURGY.) In the manufacture of alloy steels, the electric furnace was found to give far more satisfactory results than any method that had been used. There was a great increase in the use of electric power also for the electrolysis of water for the production of oxygen and hydrogen on account of the increasing demand for these two gases for many purposes. Many plants also were using the electrolytic processes for producing "hypochlorite solution," or bleaching liquor for laundry uses. While not by any means new, electrolytic plants for the refining of zinc and copper were largely increased.

The location of many electro-chemical plants near New York City during the year was noted. The former considerations that governed the location of electro-chemical plants within a short distance of Niagara Falls were no longer effective for the reason that the available power capacity at that point had been reached; but there were many plans about to be put under way at the close of the year for the location of new industries near the Southern hydro-electric plants where the supply of energy was abundant and cheap.

**ELECTRIC BATTERIES.** Although steady progress in the use of electric vehicles was noted during the year, there was no marked improvement in storage batteries. Types had become standardized for commercial purposes, and their capabilities and efficiencies were well known; but nothing of an epoch-making nature was produced. A few new primary cells were brought out, some for laboratory standards, and some for ignition purposes; but on the whole, these were merely modifications of already well known cells.

**ELECTRIC GENERATORS AND MOTORS.** See DYNAMO-ELECTRIC MACHINERY.

**ELECTRIC LIGHTING.** Progress in electric lighting during 1916 was along somewhat restricted lines. There was a great increase in the number of units available in gas-filled tungsten lamps. The manufacturers in response to constantly increasing demands seemed to have been able to produce these lamps in almost every size and capacity for which the old style carbon lamps had been made. Their use was varied correspondingly, but it must be noted that in certain instances, owing to the intense brightness of the gas-filled lamp, illuminating engineers have found it desirable to shade these units with some form of translucent globe for exterior

illumination, and with globes that would act efficiently as color screens for interior use. A better educated public taste and the ever increasing influence of the suggestions of illuminating engineers were bringing about considerable change in the types of interior illumination, particularly for places of amusement and other public buildings. While for certain purposes it was deemed important to attain as nearly as possible day-light illumination with artificial illuminants, it was found that such arrangements must be used with due regard to the buildings or areas to be lighted, as well as to the effect of the lights upon the eyes of the majority of persons exposed to them. For street illumination, there was, as was pointed out in the 1915 YEAR BOOK, a rapid and progressive change from the arc lamps, formerly almost universal for this purpose, to some of the more powerful types of gas-filled tungsten units, not only on account of the higher efficiency of the latter, but also on account of the ability to arrange these units more effectively at a given cost for energy than could be done with arc lamps. The flaming and other types of luminous arcs, however, were still very largely employed for street lighting purposes. Operating at high efficiency and having a low maintenance cost, they prevented the still wider introduction of the gas-filled incandescent lamps, and it was seriously questioned whether, for this particular field, the limit of usefulness for the latter had not about been reached.

It was noticeable also in connection with improvements in both public and domestic lighting arrangements that far more regard than ever before was paid to the physiological effect of the number and arrangement of lights on the persons exposed to them. Much greater attention was paid in the schools and colleges to the lighting arrangements wherever any task involving close work with the eyes was in question. Among other matters the Life Extension Institute, of which Dr. Eugene Lyman Fisk is director, was directing the attention of its members to the importance of preserving eyesight by every possible means. A noticeable advance in search-lights was made during the year in the development of the Sperry light and projector.

While not involving any new principle, the increasing use of flood-lighting for large structures, such as buildings and statues, was one of the events of the year. While flood-lighting had been employed as a means of brilliantly illuminating a group of buildings or portions of a particular building, it was formerly accomplished by means of search-lights, whose rays were directed at such an angle as to be reflected from portions of the structure and produce striking contrasts of light and shadow. During the past year, however, the same kind of effect was produced with a smaller consumption of energy, and with better results from the standpoint of illumination by employing a large number of gas-filled incandescent lamps, the rays of which were concentrated by reflectors on those portions of the structure that were to be illuminated. The design of many buildings made this matter an easy one by allowing the lights to be so located on the building itself as to be invisible to the ordinary observer. The Statue of Liberty in New York Harbor was thus illuminated with great success, from both an artistic and an engineering standpoint, and a ceremony, in which

the President of the United States participated, inaugurated the new system. The City Hall in New York and other buildings elsewhere were similarly set-off by this kind of lighting, which produces effects of an entirely different character from any that could be secured either by means of search-lights or by the older method of outlining a structure with strings of incandescent bulbs.

**ELECTRIC POWER, TRANSMISSION OF.** There were no large new undertakings in the transmission or distribution of electric energy during 1916. The high price of copper and aluminum constituted one of the causes of this condition, for it was realized that the market for these metals was at a temporary high level from which it might fall suddenly as soon as the conditions existing during the year had passed. Another and very potent factor making for hesitation and timidity of capital was the unsettled state of water-power legislation. The policy of the United States government towards those desirous of developing water-powers was in a chaotic condition and many of those who advocated more liberal methods of dealing with the promoters of such enterprises were assailed as being in the employ of special agents of a so-called "water-power trust," etc. Several measures were about to be considered by Congress, but up to the close of the year nothing was done.

In this connection, too, the subject took on added interest on account of the inability of American manufacturing plants at Niagara Falls to obtain energy any longer from the Canadian power companies by reason of the war. A bill was under consideration by Congress for granting the privilege of using a certain additional quantity of water from the American side of the Falls to relieve the plight of manufacturing plants there.

The established hydro-electric power companies were doing an increased amount of business in the sale of energy to electro-chemical plants within reach of their distribution lines. In connection with their business activities it was also noticeable that many interurban electric railways were arranging to obtain an additional supply of energy when needed from those companies, instead of building new generating stations. It was the general belief among electrical engineers that in the further electrification of steam railways, the latter would become valuable customers of the large electric power companies. One of the most important instances of this tendency was the purchase of electric energy by the Chicago, Milwaukee, and St. Paul Railway from the power company located at Great Falls, Montana. In connection with the government policy of preparedness, an appropriation was made by the Sixty-fourth Congress for the establishment of a plant for the production of atmospheric nitrogen. (See CHEMISTRY, INDUSTRIAL.) While this seemingly afforded an excellent market for the output of electric generating stations in that part of the South where power plants had been located, it was not believed by engineers that the process could compete successfully on a commercial scale with other methods for the production of nitric acid. In various parts of the United States plans were under way for the inter-connection of many large electric power systems for the purpose of equalizing the load among many large systems, and at the same time securing power at a minimum cost to the con-

sumer. The number of large power companies and the varying needs of the districts which they serve render this problem difficult of solution.

In its technical aspects the transmission of electric energy did not show any special advance over 1915, the same kind of generating and receiving apparatus being employed; and while the transmission of high tension direct currents, as had been practiced in Europe on a limited scale, was discussed, it was not applied in the United States to actual practice.

There was no change in the degree of voltage employed on energy transmission lines, the maximum remaining at 150,000 volts, as had been found desirable on several lines in 1915; and 100,000 volts had become standard for circuits of more than ordinary length. The improvement in the quality of insulators, and the great attention given to the maintenance of such lines, reduced greatly the troubles formerly experienced. An increasing tendency to place switching devices and transformers out of doors, thereby involving much lower initial cost, was also a marked feature of the year's practice. These outdoor sub-stations seemed to give satisfactory service under every climatic condition to which they had been exposed.

**ELECTRIC RAILWAYS.** Owing to the difficulty experienced by the railways in securing additional capital, and the high prices of material that prevailed, the application of electric power to steam railways made little notable progress during 1916. Undertakings already started, were being completed during the year, it is true; and under more dependable financial and economic conditions it is likely that many new electrification plans would have been put into execution. As mentioned in the 1915 YEAR BOOK, the electrification of the mountain divisions of the Chicago, Milwaukee and St. Paul Railway was pushed rapidly in 1916, 406 route miles being so equipped, and it was expected that the entire 440 miles of route between Harlowton, Mont., and Avery, Idaho, would be under electric operation early in 1917. The 3000-volt direct current locomotives put in use on this line in 1915 proved in service capable of doing even more than had been expected of them, having ample tractive power for all conditions of weather and being more dependable than steam locomotives during periods of severe cold waves. They hauled 3500-ton trains up 2 per cent grades at satisfactory speed. From both a mechanical and an operating standpoint, the electrification of this road was an unqualified success.

One feature of the St. Paul locomotives, which were built by the General Electric Company, that attracted wide notice from engineers and railroad men, was the system of regenerative control. This had not been applied to direct current locomotives before, and the experience on the St. Paul demonstrated that it was entirely capable of controlling the heaviest trains on the steepest grades, as well as effecting a considerable saving in the wear of brake shoes and wheel treads.

The Pennsylvania Railroad during 1916 was applying its projected electrification to its line between Philadelphia and Chestnut Hill, about 12 miles, and it was the intention to operate it with motor cars propelled by alternating current obtained from overhead conductors, as was done on its line to Paoli during the previous year.



Both the New York Central and the Butte, Anaconda, and Pacific added to their already large equipment of electric locomotives. These were of the same type that had been in use, and afforded a confirmation of the reliability of this type shown by a continuous service of several years.

Satisfied with the successful operation of electric locomotives, the Norfolk and Western was adding 15 miles of electrified line, equivalent to 50 miles of single track, at the western end of its electrified section in West Virginia, described in the 1915 YEAR BOOK. Part of this work included branch lines tapping the coal mining districts.

In Canada, the Canadian Northern, which had almost ceased work on its Mt. Royal tunnel on account of the war, was resuming operations toward the end of the year. It may be recalled that this involved the electrification of the line from a new station in the city of Montreal, through a tunnel under Mt. Royal, to a point about nine miles out. 2400-volts direct current supplied through overhead conductors was the system adopted, and a few of the electric locomotives had been delivered and were being used on construction work at the close of the year.

In England, the electrification of several steam railways was continued during the year. The London and South Western Railway equipped about one hundred and fifty miles of its suburban lines near London with the direct current system, the energy being supplied through a third rail. The London, Brighton, and South Coast was also operating a limited service near London, and had under consideration a much more extensive plan for future development. The London and North Western had also equipped a portion of its lines with electric power, but owing to the heavy construction work involved at certain points, the scarcity of labor, and other war conditions, a comparatively small part of the projected scheme had been carried out at the end of the year. See also SWITZERLAND.

**ELECTRIC SHIP PROPULSION.** See DYNAMO-ELECTRIC MACHINERY.

**ELECTRIC SHOCK.** See RESUSCITATION.

**ELECTRIFICATION OF RAILWAYS.**

See ELECTRIC RAILWAYS.

**ELECTRO-CHEMICAL SOCIETY, AMERICAN.** See CHEMISTRY, INDUSTRIAL.

**ELECTRO-METALLURGY.** See METALLURGY.

**ELEMENTS.** See CHEMISTRY, INDUSTRIAL.

**ELEPHANT BUTTE DAM.** See DAMS.

**ELEVATOR, GRAIN.** A notable grain elevator with an ultimate storage capacity of 10,000,000 bushels was under construction during the year for the Armour Grain Company at 124th Street and the Calumet River, Chicago. This would be the largest grain elevator in the world and could be compared with that of the Canadian Northern Railway at Port Arthur. The working house of the Chicago elevator was to have a bin capacity of 1,000,000 bushels and be able to receive and dispatch 360,000 bushels in 10 hours. Grain could be discharged from ships at a rate of 20,000 bushels per hour and from storage into barges on the river side at a rate of 120,000 bushels per hour. The elevator consisted of circular storage bins of concrete 105 feet high and 22½ feet in diameter. See CONCRETE.

**ELGAR, SIR EDWARD.** See MUSIC, *England*.

**ELIZABETH, DOWAGER QUEEN OF RUMANIA,** known generally by her pen-name, "Carmen Sylva," died at Bucharest March 2, 1916. She was born at Neuwied, the capital of the mediatized principality of Wied, in 1843, her father being Prince Hermann of Wied and her mother Princess Marie of Nassau. From the former she inherited the literary tastes and abilities which were to give her a unique place among European monarchs. She mastered several languages, gave great promise as a musician, and grew up with democratic sympathies. In 1869 she was married to Prince Charles of Hohenzollern, who had been chosen Prince of Rumania, and who in 1881 became King. They had but one child, a daughter, who died at the age of four. King Charles died in 1914. From the beginning of her residence in Rumania, Queen Elizabeth identified herself with the life of the people. She interested herself especially in the native artistic industries, handicrafts, and embroideries; founded charitable institutions, becoming especially known for her work for the wounded during the Russo-Turkish War; and was the patron of Rumanian artists and writers. She herself wrote first anonymously, then as Carmen Sylva; her authorship did not long remain a mystery. Although she published 20 volumes in German, which was her native language, and only one in another language, English, her sympathies were always with the French. Two of her well known collaborators were Mite Chremnitz and Helen Vacaresco. Translations of Carmen Sylva's works have appeared in 11 European languages. Among her collections of Rumanian legend and folklore, a subject that greatly interested her, is *The Bard of the Dimbovitza*. The Prix Botta of the French Academy was awarded in 1888 to her volume of prose aphorisms, *Les Pensées d'une Reine*. Others, in English, are *Pilgrim Sorrow*, *A Real Queen's Fairy Tales*, and *From Memory's Shrine* (reminiscences). In 1882 she was elected a member of the Academy of Sciences at Bucharest, and in 1914 honorary fellow of the Royal Society of Literature of the United Kingdom.

**ELKUS, ABRAM I.** An American lawyer and publicist, appointed Ambassador to Turkey by President Wilson July 18, 1916. He succeeded Henry Morgenthau, who resigned to take an active part in the President's campaign for reelection. Mr. Elkus was born in New York in 1867 and attended the University of the City of New York and later Columbia Law School. After his admission to the bar in 1888, he practiced law in New York. He served as special United States attorney in prosecution of bankruptcy frauds, as counsel for the Merchants' Association of New York, and in 1911-12 as counsel for the New York State Factory Investigating Commission. The laws passed on the advice of this commission and designed to improve industrial conditions, especially as regards child labor and the labor of women, were drafted by Mr. Elkus. In 1911 he became a regent of the University of the State of New York. Since the Democratic National Convention of 1912 he has been known as a supporter of Mr. Wilson.

**ELLIS, EDITH M. O.** (MRS. HAVELOCK ELLIS). An English Socialist, author, and lecturer, died in London, Sept. 14, 1916. Born in 1861 into a Lancashire family named Lees, she became secretary of the New Life Fellowship,

an organization allied with the socialistic Fabian Society. At that time she met Havelock Ellis, whom she married in 1891. Her husband became a leading English sociologist, and she herself, a believer in various social reforms, wrote on such subjects as *A Novitiate for Marriage*. Although her own marriage was a happy one, she maintained that it was right and desirable for a wife to be economically independent; so she hired a cottage in Cornwall and made a living partly from the land, partly from lecturing, and partly from her writings, chief of which were stories about the Cornwall people. She published: *Kit's Woman: A Cornish Idyll, Attainment, My Cornish Neighbors, The Imperishable Wing, Love Acre, Three Modern Seers*, and three plays entitled *Love in Danger*. In 1915 Mrs. Ellis lectured in the United States. Her body was cremated and the ashes scattered on Hampstead Heath.

**ELLIS, EDWARD SYLVESTER.** An American writer of boys' stories and historical books, died at Cliff Island, Casco Bay, Maine, June 20, 1916. His home was in Montclair, N. J. Mr. Ellis, who was born at Geneva, Ohio, in 1840, was for some time a teacher, becoming principal of the high school in Trenton, N. J., and later superintendent of schools there. Success in telling stories to some of his earliest pupils led him to devote himself largely, after 1876, to the writing of juveniles, and it is in this field that he became noted. His "Deerfoot" and "Ned" Series were among the most popular. Of *Seth Jones, or the Captive of the Frontier* 500,000 copies were sold, and translations were made into 11 languages. Altogether, Mr. Ellis was author of more than 100 books of this type, some written under the pen name of "Lieut. R. H. Jayne." In addition he prepared many text books for schools, especially on American history.

**EMBARGOES.** See RAILWAYS.

**EMIGRATION.** See IMMIGRATION AND EMIGRATION.

**EMPLOYERS' ASSOCIATIONS.** See TRUSTS.

**EMPLOYERS' LIABILITY.** See WORKMEN'S COMPENSATION.

**ENGINEERING.** In any record of engineering progress and development in 1916, two features must stand out with special prominence. First, the ever increasing dependence of the fighting armies and navies in Europe on mechanical, technical, or other scientific appliances and methods, so that modern military engineering might be said to be inclusive of all civil engineering, using the term broadly and in its oldest sense. Second, that the peculiar economic existing conditions required of engineers that they devote themselves to problems of production, construction, and operation so as to secure maximum results immediately rather than desire new methods or innovations in design. Obviously such conditions were necessary corollaries of the great war, and the part played by engineering will be more than suggested by reference to the article on MILITARY PROGRESS. Such mechanical appliances as the "tanks" or caterpillar motors, the development of involved machine guns, and other ordnance, the use of machinery for trench digging, and the wholesale manufacture and use of asphyxiating gases and liquid fire, may be cited as a few instances where the arts and mechanism of peace were applied to war.

Likewise the development in AERONAUTICS (q.v.) represented mechanical engineering of a special and refined type which had brought about a more efficient internal combustion motor with the power and reliability requisite for sustained flight, as well as aeroplanes of stronger frame and sustaining surfaces.

The part played by the engineer in NAVAL PROGRESS (q.v.) was quite as conspicuous. The naval architect was designing BATTLESHIPS (q.v.) and battle cruisers of ever greater size and speed, and their propelling machinery alone presented new and interesting problems for the marine engineer to solve in one way or another. The SUBMARINES (q.v.) as engines of destruction continued to show developments in seaworthiness and increased radius of operations, and this too was the result of the work of technical men in designing and constructing no less than skillful seamanship.

In all fields of engineering the war had the effect of stimulating production to a maximum, especially where the products had a direct relation to the struggle, and indirectly where ordinary sources of production were closed or restricted. Thus to supply copper the metallurgical engineers were forced to extend the capacity of old plants and build new works where the latest methods were installed on a large scale (see METALLURGY). For IRON AND STEEL (q.v.) all facilities of production were more than taxed in a record-breaking year for the American industry. Everywhere there was a demand for machinery for the manufacture of munitions of war both in the United States and in Europe, and all was of the latest and best types yet without opportunity for experiment of improvement. In this field of increased production the chemical engineer was playing his part and under CHEMISTRY, INDUSTRIAL, may be found some record of new developments involving huge plants for the manufacture of explosives, dye-stuffs, nitrates, metals, alloys, etc. In mechanical engineering an important branch is the automobile (see AUTOMOBILES) and, while the technical developments of the year were in no way striking, yet various economic and industrial considerations were closely allied to engineering progress. In all of this in the field of organization and works and management and labor adjustments there was a distinct note of progress.

Discussing civil engineering proper, one finds under such individual heads as AQUEDUCTS; BRIDGES; CANALS; DAMS; DOCKS AND HARBORS; DRAINAGE; FLOODS AND FLOOD PREVENTION; FORESTRY; IRRIGATION; LIGHTHOUSES; RAILWAYS; ROADS AND PAVEMENTS; TUNNELS; WATER WORKS AND WATER PURIFICATION, important fields where important developments of the year are chronicled. Thus the extension of the Catskill Aqueduct marked further progress in the great scheme of water supply for New York, while the failure in hoisting into position the central span of the ill-fated Quebec Bridge afforded one of the now rare examples where plans and calculations of engineers are upset, with resultant and serious damage. The improvement of the docks and harbors in the United States was of particular interest in 1916, as was the attempt of many communities in the Middle West to deal effectively and once and for all with the menace of floods.

In railways the engineer was forced to subor-

minate construction to economics of maintenance and operation even under unusually heavy traffic, and to share with the financiers and practical economists the burdens of efficient administration which peculiar conditions in the United States made essential. In Europe the operation of the railways since the war had become a military problem, and one that in practically all the warring nations was being solved effectively under abnormal conditions. Great tunnels were being completed in 1916, and while little new work was set on foot some ambitious projects were advanced for discussion.

The problems of municipal and sanitary engineering continued to attract attention in 1916. MUNICIPAL OWNERSHIP (q.v.) often brought the engineer before the public more prominently, and such fields as CITY PLANNING, SEWERAGE AND SEWAGE TREATMENT, and GARBAGE AND REFUSE DISPOSAL (qq.v.) showed progress which is given in the usual articles elsewhere.

The distinct improvement in FIRE PROTECTION (q.v.) manifest in 1916 unfortunately did not appear in the annual fire loss statistics on account of several serious conflagrations or fires due to the abnormal conditions of war traffic and munitions manufacture. In ARCHITECTURE (q.v.) activities continued in 1916 (see also BUILDING OPERATIONS), while such materials of construction as CONCRETE (q.v.) figured with even greater importance.

In electrical engineering perhaps the manufacturing side bulked the largest in 1916, for under ELECTRICAL INDUSTRIES (q.v.) an extraordinary record of American activity is summarized. In ELECTRIC LIGHTING (q.v.) the progress of previous years continued with such developments as flood-lighting. Under ELECTRIC RAILWAYS (q.v.) the steps towards the fuller realization of the electric operation of main lines are detailed. No limit seemed to have been reached for generators, for under DYNAMO-ELECTRIC MACHINERY (q.v.) we may read of some units of great capacity. The transmission of ELECTRIC POWER (q.v.) figured again, while the scope and range of WIRELESS TELEGRAPHY (q.v.) was again extended.

The unusual conditions of the war brought about great activity in marine engineering in the United States, and SHIPPING and SHIPBUILDING (qq.v.) continued the growth of 1915 on a scale much greater than could have been recorded in earlier issues of the YEAR BOOK, not only in the field of warship construction, but large ocean craft for international trade, as well as coastwise craft. As regards prime means the demands of new plants produced new calls for BOILERS; STEAM ENGINES; STEAM TURBINES; and INTERNAL COMBUSTION ENGINES (qq.v.); without however any striking novelties of design. The derivation of power from a volcano as developed in Italy was certainly an interesting item of the year (see VOLCANOES).

The foregoing titles and subjects indicate some of the fields where the progress was of special interest and where the individual articles elsewhere in the YEAR BOOK may be consulted with profit. They do not, however, reflect any startling developments or novelties in design and construction, and the wholesale preoccupation of European engineers in military activities and those of America in productive enterprises furnishes a ready explanation. Technical advances were by no means to stop, however, for a certain

amount of experimental work was in progress even in connection with war enterprises, while such institutions as the United States Bureau of Standards, and research committees or laboratories of professional societies or educational institutions continued their labors.

**ENGLAND.** See GREAT BRITAIN.

**ENGLAND, CHURCH OF.** During 1916 all church questions were necessarily considered in relation to the great war. The Archbishops of Canterbury and York called on the church to take up a great spiritual movement which has been designated "The National Mission of Repentance and Hope." This occupied the months of October and November, 1916. The Archbishop of Canterbury, speaking for the bishops, said: "We believe that if the victorious outcome which we expect and pray for in this war is to take shape, in every sense, for good, we must recognize plainly, outspokenly, deliberately, humbly, that there are a great many faults of ours to be corrected, a great many weak, wayward efforts to be refashioned by God's help into something straighter and stronger. We are very far as yet from having secured, among the men and women of our land, clergy or laity, military or civil, that sort of spirit. If we are to get it we must think of it, strive for it, pray for it—yes, above all, pray for it. That is what our national mission is for. We are going to try, by every corporate and separate effort that we can make, under the guidance of our living Lord, to create and foster that true spirit to quicken our eyesight as to what our faults have been."

One of the results of the war has been the erection of numerous wayside crosses or Calvaries, in memory of those who have died for their country. It was felt that this practice would be more fruitful of good results than that of putting brass tablets in a public building. Prayer Book revision has been put aside for the present, as the lower house of the Convocation of Canterbury at its winter session postponed the revision scheme. An active movement in behalf of the repeal of the Welsh Church Act was going on in 1916. The commissioners under that act have asked from the clergy full information as to parochial endowments and other sources of income. The Bishop of St. Asaph said that under the act incumbents appointed since September, 1914, have no existing interests in their benefices, and that as a result, when the war ends and the act takes effect, these benefices will be left without a farthing of the ancient endowments, and the priests appointed thereto will have no vested interests.

The committee appointed to consider the need of new dioceses and the readjustment of new boundaries within the Province of Canterbury reported that a further subdivision of dioceses is necessary, that a diocese should not exceed 300 parishes, and that the appointment of bishops suffragan in overgrown dioceses is only desirable as a temporary expedient. Rev. Dr. Wild, Archdeacon of Nottingham, was consecrated Bishop of Newcastle at York Minster. The King nominated Rev. F. T. Woods to be Bishop of Peterboro.

**ENGLISH LITERATURE.** See LITERATURE, ENGLISH AND AMERICAN.

**ENGLISH PHILOLOGY.** See PHILOLOGY, MODERN.

**ENTOMOLOGY.** A noticeable development in recent economic entomology has been the in-

creasing attention paid to insects as carriers of human diseases and the housefly, or "typhoid" fly as Howard has named it, has received the greater amount of this attention in temperate climates. Experiments reported during the year 1916 had to do with the discovery of methods of destroying the larvæ, with destruction of the adults, and with the method of distribution of the adults as bearing on the question of their elimination. It was generally agreed that horse manure is the usual breeding place for these insects, and although they may occur in great numbers in other places such as garbage receptacles, they go to these places for food and not to lay their eggs. Garbage which is of an acid reaction is fatal to the larvæ, and hydrochloric acid to be sprinkled over manure is recommended as a larvicide. Other larvicides recommended were borax and hellebore in the proportions respectively of two-thirds of a pound, and one-half pound, to ten gallons of water sprinkled over eight bushels of manure. Another formula was calcium cyanid and acid phosphate, using one-half pound of each per bushel of manure. The distribution of flies is in response to tropic stimuli, those leading to feeding and those leading to egg laying being apparently different from one another. It is not certain to what extent flies go with the wind, and to what extent against or across it, but experiments show that they will go for more than a mile if necessary in order to procure food.

Termites do much damage to wooden foundations of buildings and the obvious remedy is to replace them with concrete. Snyder recommended in cases where this is not possible, the soaking of timbers not in contact with the ground in a 6 per cent solution of zinc chloride or a 1 per cent solution of mercury bichloride. Timbers in contact with the ground may be impregnated with tar creosote. Experiments have been tried of putting poisonous substances into wood pulp materials, but these have not been successful. In connection with the study of termite activities, it was reported that in the hurricane of 1915, the previous mining of timbers in houses in New Orleans had so weakened them that a much greater amount of injury than would otherwise have happened was done by the hurricane.

The Argentine ant appeared in California in 1905 and in 1916 was reported as having spread over a territory 700 miles long. It was especially troublesome in the vicinity of Berkeley, where preventive measures were fairly successful if undertaken by the municipality but not if under private management.

As publication No. 3 of the British Museum Economic Series, Wasterson wrote on *Fleas as a Menace to Man and Domestic Animals*, the paper having reference to the part these insects play in carrying the plague bacillus.

For the work of the Federal Bureau of Entomology the sum of \$868,880 was appropriated for the year beginning August 1, 1916. This is in addition to the amounts appropriated by the several States in carrying on their regular entomological work, and for special investigations such as the gypsy moth work in New England. See also ZOOLOGY.

**ENTRANCE REQUIREMENTS, COLLEGE.** See UNIVERSITIES AND COLLEGES.

**EPILEPSY.** Reed's announcement in 1914 of his belief that constipation was a very essen-

tial factor in the causation of epilepsy, and later that he had isolated a bacillus from the blood of epileptics, which bacillus, flourishing in the intestine, produced the toxic substance which brought on epileptic attacks, was responsible for a good deal of discussion and research by other investigators. In a communication appearing in the *Journal of the American Medical Association*, May 20, 1916, Reed describes the organ as a spore-bearing bacillus, staining best with carbolfuchsin, less satisfactorily with methyl blue and by Gram's method. The organisms grow freely either in agar-agar or bouillon, 104° F. being the favorite temperature. Growths appear from the second to the fifth day, when a smear shows the organism, which may be recognized as a short, thick bacillus, with blunt ends. The bacillus is actively motile. Sporulation becomes marked as the culture grows older, until the nutritive substance in the medium is exhausted, when the bacillus itself disappears, leaving behind it its spores. Experimental studies of this organism were made with rabbits, first by injecting a suspension of the bacilli into the veins. Apparently typical epileptic seizures were produced and from the blood of the inoculated animal the specific bacillus was recovered. Suspensions were also injected into the peritoneal cavity to determine the toxicity of the germ. The animal died in about seven hours and on autopsy death was shown to be obviously due to toxic absorption. Reed is of the opinion that the human epileptic is infected through the alimentary canal; he also believes that the infection may be communicated from one person to another. Reed calls attention to the fact that Bra, in 1902, in a communication to the French Academy of Science, announced that he had isolated an organism from the blood in 70 out of 100 cases; that he found it only in epileptics and only preceding or immediately following a seizure; that it disappeared from the blood in the interval. Reed's claims are supported by the investigator Terhune, who found that in cultures made from the blood of 24 epileptics during or immediately following seizures the bacillus was present in 75 per cent.

**EPIRUS.** Anciently the northwesternmost division of Greece. This region in modern times has had no definite political boundaries, and the name Epirus has been applied to Southern Albania and Northwestern Greece. Part of Albanian (Turkish) Epirus was annexed to Greece after the Balkan wars of 1912-13; in November, 1914, Greece occupied northern Epirus and in March, 1916, formally took possession of it. The population of Epirus is more or less conjectural, but is supposed to approximate half a million. The towns include Janina (population about 16,800), Argyrocastron (12,000), and Koritza (8000).

**EPISCOPAL CHURCH.** See PROTESTANT EPISCOPAL CHURCH.

**EPWORTH LEAGUE.** See articles on Methodist denominations.

**ERITREA.** An Italian colony on the west shore of the Red Sea. Estimated area, 45,800 square miles; population, 279,000. Asmara is the capital. There are 74 miles of railway. Imports and exports were valued in 1913 at 20,453,500 and 11,589,744 lire respectively; transit, 2,895,778 lire. The 1913-14 budget balanced at 13,444,851 lire.

**ERZERUM.** See WAR OF THE NATIONS.

**ESPERANTO.** See INTERNATIONAL LANGUAGE.

**ESSAYS.** See LITERATURE, ENGLISH AND AMERICAN.

**ETHICS.** See PHILOSOPHY.

**ETHIOPIA.** See ABYSSINIA.

**ETHNOGRAPHY.** See ANTHROPOLOGY.

**ETHNOLOGY.** See ANTHROPOLOGY; PEABODY MUSEUM.

**EUGENICS.** Rapid strides have been made, during the past year, in the popularization of knowledge in this field. The war has called forth an unusually large number of books and articles dealing with the probable biological effect of the conflict upon the race. Foremost among these, perhaps, is David Starr Jordan's *War and the Breed* (Boston), in which the idea that war is an important factor in changing the inborn nature of the human race is explained with a wealth of illustration and in a most readable way. Another book of importance, on the same theme, is George Nasmyth's *Social Progress and the Darwinian Theory—a Study of Force as a Factor in Human Relations* (Introduction by Norman Angell) (New York). A third is W. E. Ritter's *War, Science, and Civilization* (Boston). A less specialized book is Prof. M. F. Cuyler's *Being Well-Born* (Indianapolis). *The Jukes in 1915*, by A. H. Estabrook, published in 1916 by the Carnegie Institution of Washington, brings the history of that remarkable family down to date. F. J. Warne's *The Tide of Immigration* (New York), among other topics, discusses the eugenic effects of differential birth rates among immigrant stocks. The eugenic effects of changes in birth and death rates was also discussed by Prof. W. F. Willcox, of Cornell University, in a remarkable paper read at the Second Pan American Scientific Congress, held at Washington, D. C., entitled: "Fewer Births and Deaths: What Do They Mean?" His most important conclusions were as follows: (1) The death rate cannot be expected to fall much below where it now stands in healthy districts. (2) There is no such natural limit to a fall in the birth rate. (3) The spread in the volitional control of the birth rate is a change against which, even if we believe it undesirable, it is hopeless to struggle. (4) Legal regulation of marriage in the effort to diminish the number of births of diseased or otherwise undesirable children seems likely, unless accompanied by segregation, to do more harm than good. (5) The social service rendered by parents who have hereditary qualities of great value and make heavy sacrifices in other directions in order to rear families of normal size or larger, is likely in the future to be much better appreciated and requited. (6) Persons interested in maintaining the numbers and improving the quality of the population should aim not merely or mainly at a continued reduction of the general death rate, but also at the gradual education of public opinion towards a readjustment of the birth rate in various classes which will enable society to gain from its best strains more than it can do under present conditions. Another article of great importance was that of Dr. J. C. Phillips, published in the *Harvard Graduates' Magazine* for September, 1916, on "Harvard and Yale Birth Rates." In it explicit and startling information is given concerning the rapid decline in the size of the families of graduates of these institutions during the past 40 years. Excellent

evidence of a growing attempt to combat such conditions is found in *The Mothercraft Manual* (Boston), by Mary L. Reed, Director of the School of Mothercraft in New York City. For those interested in the biological basis of eugenics no more important work has been published for many years than *The Mechanism of Mendelian Heredity*, by Prof. T. H. Morgan, of Columbia, and others (New York). Recent translations of Binet's *The Development of Intelligence in Children* and *The Intelligence of the Feeble-Minded*, published by the Training-School at Vineland, N. J., should not be overlooked by those who desire to understand something of the psychological phases of the problems of eugenics. Two new periodicals were founded: *The Eugenic News*, the first issue of which appeared in January, 1916, under the imprint of the Eugenics Record Office, Cold Spring Harbor, L. I., and *Genetics*, published bi-monthly by the Princeton University Press. See NATIONAL BIRTH CONTROL LEAGUE; ZOÖLOGY, *Heredity*.

**EUROPEAN WAR.** See WAR OF THE NATIONS.

**EVANGELICAL ASSOCIATION.** A religious denomination principally composed of German-born citizens of the United States. Its doctrines are practically the same as those of the Methodists, and its communicants belong to nearly all parts of the northern section of the United States and Canada. There are also many to be found in the West and South. The missionary work of the Association is carried on chiefly among the Italian immigrants. In 1916 the denomination had 115,243 communicants, 1663 churches, and 1031 ministers. The Church is divided for administrative purposes into 24 districts, has over 175,000 pupils in the Sunday schools, and a Young People's Alliance whose membership numbers over 50,000. A preaching house is maintained in Cleveland, O., and there are several philanthropic institutions and hospitals in Chicago, Philadelphia, and cities throughout the Middle West. Northwestern College, Naperville, Ill., is the leading educational institution.

The United Evangelical Church is a denomination of the same doctrinal beliefs and polity as the Evangelical Association. In 1916 it had a total membership of 89,920, being an increase of 3029 over 1915, 516 itinerant preachers, 221 local preachers, 948 organized congregations, 920 churches, and 950 Sunday schools. The total value of church property in 1916 was \$5,699,129. Its Sunday schools had 14,055 officers and teachers, 123,194 scholars, and, with home department and cradle roll, a total enrollment of 152,220. The Young People's Societies of the denomination were in a flourishing condition in 1916. The missionary work, both home and foreign, was successful. There were 307 home missions in operation in 1916, an increase of four over 1915, and these missions had a church membership of 35,425, and a Sunday school enrollment of 61,240. The missionary work in China in 1916 was vigorously prosecuted, and a theological school was opened at Hunan. The leading educational institutions are Albright College, Western Union College, the Bible Teachers' Training School, New York City, the Oregon Bible Training School, and the Illinois Training School for Christian Workers. The publishing house is at Harrisburg, Pa.

**EVOLUTION.** See ZOÖLOGY, *Evolution*.

**EXHIBITIONS, ART.** See PAINTING AND SCULPTURE.

**EXPERIMENTAL PSYCHOLOGY.** See PSYCHOLOGY.

**EXPERIMENT STATIONS.** See AGRICULTURAL EXPERIMENT STATIONS; HORTICULTURE.

**EXPLORATION.** (For Arctic and Antarctic exploration see POLAR RESEARCH.) Progress in perfecting the knowledge of the unexplored regions and of the resources of the earth has been seriously retarded through the great European war. Although the field for original exploration of uninhabited and unknown areas is still vast in extent, yet the tendency steadily grows to devote more and more energy to the solution of geographical problems of marked human interest, along economical, historical, and scientific lines. The most important geographical field work of the year 1916 has been accomplished in South America by Farrabee, in Asia by Stein, in the Antarctic regions by Shackelton, and in the Arctic regions by Rasmussen and Stefansson.

**AFRICA.** Except in connection with military movements, exploration and research have ceased on this continent. However, surveys were made through some unexplored areas in the construction for war use of the British railway from Voi to the northern terminus of the German railway system at Moshi, under the very shadow of snow-capped Kilimanjaro.

**NORTH AMERICA.** (See ALASKA.) It will be a matter of surprise to many to learn that more than one quarter of the Dominion of Canada is as yet unexplored, the greater portion being in western regions. In an effort to ascend Mt. Kitchi, Miss M. L. Jobe in a journey via Jarvis Pass to Mt. Ida and the headwaters of the Wapiti River, traversed in part unmapped territory. The most extended researches, south of Dr. Anderson's work on the Arctic coast in conjunction with Stefansson, are those of Mr. Christian Leden, who reports that in three years (1913-16) he made important ethnological studies of practically unknown tribes in the unexplored regions to the west and north of Hudson Bay. These natives inhabit the country between Dawson Inlet and Reindeer Lake, Dawson Inlet and Ferguson River, around Southampton Inlet, west of Rankin Inlet, and between Chesterfield Inlet and Repulse Bay. Leden's studies are said to cover the history, religion, habits, and domestic life of the natives.

**SOUTH AMERICA.** Only 1 per cent of the area of Brazil is mapped on a standard scale, principally in the state of São Paulo: this condition is indicative of the amount of territory as yet unknown. Important results, geographically and scientifically, were obtained by the expedition of the University of Pennsylvania Museum, under Dr. W. C. Farrabee, which was equipped principally for ethnographic research. The region visited was in the north-central watershed of the Amazon—principally in the borderland of the Guianas—Brazilian and British. Ten tribes, of the Arwak and the Carib stock, were systematically studied: several had never been visited in their villages and so were new to exploration and to science. These tribes were the Chikena, Diau, Katauiana, Kuma, Kena, Mapidian, Parikutu, Toneyan, Urukua, Waiwai, and Waiwe. Farrabee discovered and visited the central village of the Mundurucus—never before located. It is situated in the un-

explored country between the Tapajos and Xingu rivers, which proved to be a hilly, semi-desert region instead of an elevated plateau, as before surmised. The most important geographic work covered the country between the upper Essequibo and the Corentyne, of British Guiana. Farrabee discovered the sources of the Corentyne and by his astronomical observations, during his descent to the mouth, was able to correct many previous errors in the charts. Other Brazilian explorations were made by Lieut. Marquez de Souza, who was killed while surveying the unknown Ananas River, which proved to be the Cardozo River of Roosevelt's explorations.

**ASIA.** In keeping with Stein's researches have been the discoveries of Dr. C. W. Bishop, at the head of the eastern Asiatic expedition of the University of Pennsylvania, in extreme Western Szechwan, China. In the country near Kiatingfu, at the junction of the Min and Ya rivers, he found many burial caves, elaborately carved out of the sandstone cliffs and often decorated. This form of burial was that of the aborigines of this region prior to its invasion and occupation by the Chinese. With the bodies were deposited clay images of relatives and of tutelary deities in the stone or earthenware coffins.

Sir Aurel Stein in his third journey (1913-16) completed the re-discoveries of ancient centres of Asiatic culture and civilization—Buddhist, Chinese, and Hellenistic. Subsequent to his exploration of the Oxus Basin (see YEAR BOOK, 1915), by a journey of 1700 miles on foot and horseback, Stein explored (October, 1915-March, 1916) the borderland of Persia-Afghanistan, following closely the 60th meridian of east longitude from Ashkhabad to Koh-i Malik Siah, and thence due east to Quetta. On the rocky isolated hill of Koh-i Kwaja, in Seisan Province, was discovered the ruins of a large Buddhist sanctuary, the first ever located on Iranian soil. Its pictorial ornamentation includes remarkable frescoes of the Sassanian period, as well as paintings distinctly Hellenistic in style. Both in ornaments and in architecture were jointly reflected Greek and Oriental art as affected by Buddhist forms. On the Helmand Desert was found a line of watch-stations, dating about the beginning of the Christian era, extending from southernmost Hamun towards the lake-bed of Gaud-i-Zirreh. Solidly built on a uniform plan, they evidently served to protect cultivated Helmand delta from raids of nomads in the south. Among archaeological objects were stone implements of the neolithic period, articles of the bronze age, and prehistoric pottery with early Aramaic characters.

**EUROPE.** The war has dominated European activities. Among the few explorations incident to the war may be mentioned that of the comparatively unknown Turkish Island of Imbros, the nearest isle to the Dardanelles. Its geographic study and description are due to Mr. Ogilvie in connection with his geographic war service.

**MISCELLANEOUS.** Explorations, largely ethnographical, have been made in Central Borneo by Carl Lumholz. After researches on the southwest coast he entered the valley of the Busan, a branch of the Barito, where the native tribes were studied. Later he ascended the Barito to its source and, crossing a divide of

1400 feet, came to a region where the Dyaks, some 10,000 in number, were living under aboriginal conditions, uninfluenced by civilization. Traveling eastward, he struck the Kaso, and following it to its junction with the Mahakam, descended the latter river to Samarinda, on the east coast. Altogether Lumholz voyaged on these practically unknown streams more than 1000 miles in native boats.

Dr. Bauer reports that the voyages of the *Carnegie* (of the Carnegie Institution), in its ocean-wide magnetic surveys, were especially remarkable during 1916. Arriving from Dutch Harbor, Alaska, at Lyttelton, N. Z., she commenced her voyage of circumnavigation on Dec. 6, 1915, which closely followed the 60th parallel of south latitude, touching the South Georgia Islands. The *Carnegie* returned to Lyttelton April 1, 1916, having made a voyage of 17,804 nautical miles under sail in 118 days. This circumnavigation of the sub-antarctic regions is believed to be the first ever made in a single season. The non-existence of Dougherty Island was determined during this cruise, and an approach to within 40 miles of the assigned position of Nimrod Island, without any signs of land being seen, very probably eliminates this island from future charts.

Dr. Thurnwald explored the northern part of New Guinea around the sources of the Sepik River, and thence to the north coast.

**EXPLOSIONS.** See FIRE PROTECTION; NAVAL PROGRESS; UNITED STATES AND THE WAR.

**EXPLOSIVES.** See CHEMISTRY, INDUSTRIAL.

**EXPORTS.** See FINANCIAL REVIEW.

**EXPOSITIONS.** During the year the only exposition of importance in the United States was the one held in San Diego, Cal. There was also one held in the city of Panama.

**PANAMA-CALIFORNIA EXPOSITION.** This exposition which was held in San Diego, Cal., was officially closed on Dec. 31, 1915, but it was opened again on March 18th, with formal ceremonies and continued until the end of the year. In addition to the exhibits already installed, important foreign exhibits were transferred from the Panama-Pacific Exposition held in San Francisco. These gave it an international character and included the Austrian, Canadian, Dutch, French, German, Italian, Russian, Spanish, and Swiss exhibits. Additional exhibits of the California counties were secured, as well as a number of attractions for the "Zone," as the amusement section was called. Also a large portion of the government exhibits were transferred to San Diego from San Francisco.

**PANAMA-PACIFIC EXPOSITION.** The final certified statements of the revenues of the exposition, issued in March, gave the grand total of receipts for admissions and concessions as \$12,524,090. Paid admissions amounted to \$4,715,523 and the gross receipts from concessions were \$7,809,565. The net revenues from concessions were \$1,830,331. The total admissions were 18,756,148. Part of the site of the Panama-Pacific Exposition, on the edge of San Francisco Bay, was purchased in November by the Exposition Company for \$184,000, as the first definite step toward preserving and presenting the famous Exposition Marina and the Palace of Fine Arts to the city of San Francisco.

**PANAMA NATIONAL EXPOSITION.** The only foreign exposition during the year was held

in the city of Panama and had for its objects the celebration of the discovery of the Pacific Ocean by Balboa, and the strengthening of the bonds of friendship and sympathy that unite Panama and other republics of the New World, thus promoting commercial and intellectual interchange between these nations. It had its inception in 1912 and was to have been inaugurated in 1913, but for various reasons, including the great war and the greater expositions in San Francisco and San Diego, it was not opened until Feb. 6, 1916, and then ran for 100 days. A site covering over 50 acres, called "El Hatillo," just north of the city on the shore road to old Panama and less than half a mile from the railroad, was selected. The grounds rose in a gentle slope from the bay, a fine view of which and of the ocean beyond was obtained from the central promenade of the exposition. Arranged in squares about a large central plaza were the seven principal structures of the exposition. These were the Hall of Fine Arts, the Education, Commerce, Agricultural and Horticultural, and Administration buildings, and the fine permanent edifices of Spain and Cuba. The two last, named after the exposition, became the permanent homes of the legations of the two countries and the other permanent buildings were transformed into government offices. There were also a number of smaller buildings. The most important features of the exposition were the exhibits of the natural resources of Panama. These included a splendid series of specimens, showing the diversified flora and fauna of the country, and also the forestal wealth shown by many varieties of fine timber and cabinet woods. In addition to the United States, exhibits were made by Spain, Cuba, Ecuador, and Guatemala. The United States sent its government exhibit from San Francisco at the close of the Panama-Pacific Exposition, and it was described as "the most comprehensive exhibition the United States government has ever sent to a foreign country." Certain days were set apart in honor of the participating nations, and on February 22nd, "United States Day" was celebrated with appropriate exercises. At the close of the exposition on June 1st, it was found that the receipts had been sufficient to pay for the grounds, the erection of the buildings, the landscape gardening, and all salaries. The director-general was James Zetek, and the United States commissioner, William E. Tuttle, Jr.

**MINOR EXPOSITIONS.** There were held during the year the usual number of minor expositions both at home and abroad. Among them may be mentioned the following: There was an Industrial Exposition held in Dayton, Ohio, during January 14th-22nd. Brazil's first Fruit Exposition was held in Rio de Janeiro during January 30th-February 7th. A government Safety First Exposition was held in Washington, D. C., during February 21st-26th. The second annual British Industries Fair was held in the Victoria and Albert Museum in London during February 21st-March 3rd. The second annual Sample Fair was held in Lyons, France, during March 1st-15th. The usual fairs were held in Leipsic, Germany, the first called the Jubilate, beginning on March 6th, and the second called the Michaelmas, beginning on August 28th. The third annual exhibition of Siamese agriculture, industry, and commerce was held in Pitsanuloke, Siam,

beginning April 8th. An industrial exhibition was held in Taiwan, Formosa, during April 10th-May 9th. Its object was to show the progress made in Formosa during the 20 years the island has been a Japanese possession, and the revolution in commerce and trade resulting therefrom. A unique exposition of "The Reconstructed City" was held in Paris, France, for three months, beginning on May 15th. The United States was the only foreign nation admitted to participation in this exposition. The second Canadian Toy Fair was held in Toronto, Canada, during August 26th-September 11th. An industrial exposition was held in Santiago, Chile, during September 15th-November 15th.

**COMING EXPOSITIONS.** In the United States, a Mississippi Centennial Exposition will be held in Gulfport, Miss., from October, 1917, to April, 1918, to commemorate the 100th anniversary of the admission of Mississippi as a State to the Union. Ground was broken for the exposition with suitable ceremonies on Oct. 13, 1916. Also a bill authorizing the transfer of the government exhibits from San Diego, Cal., to Gulfport was introduced in Congress. The 200th anniversary of the founding of San Antonio will be celebrated in 1918 by a Texas Bicentennial and Pan American Exposition, to which Congress has authorized the President to invite the participation of Spain and the Latin American countries. The Pilgrim Tercentenary Commission of Massachusetts has reported in favor of celebrating the 300th anniversary of the landing of the Pilgrims at Plymouth by an international exhibition "which would bring together and especially emphasize the great achievements in science, religion, education, philosophy, music, and all other arts of the past 300 years. The commission also recommended the erection of a permanent memorial, the removal of the canopy from Plymouth Rock, and the lowering of the rock to its original bed.

Among the coming expositions abroad is the Hispano-American Exposition to be held in Seville, Spain, after the great war. This exposition, originally proposed to be held in 1914, is now well under way. An international Exposition of Electrical Industries, to be held in Barcelona, Spain, is planned for 1917. A British Empire Fair to be held in London, England, designed to show the development and products of every known industry in the empire, is announced for early in 1917. See **CELEBRATIONS**.

**FACTORIES.** See **ARCHITECTURE**.

**FAGUET, EMILE.** A French man of letters, died in Paris June 7, 1916. He was born in 1847 at La Roche-sur-Yon, received his education in lycées and at the Ecole Normale Supérieure, and afterward taught outside Paris till 1890, when he became professor of poetry at the Sorbonne. M. Faguet had early become a contributor to reviews on social, political, and literary subjects, and he gained such a reputation that the editorship of several of these was offered him. In 1901 he was elected to the French Academy. His books, devoted largely to literary and political history and criticism, are important for their scholarly character and for the unprejudiced point of view maintained. Faguet is rightly regarded as a constructive critic. Among the most important titles are *Politiques et moralistes du XIX<sup>e</sup> siècle* (three series, 1891-99) and *Histoire de la littérature française* (four vols., 1885-93). Writings

showing Faguet's great interest in the drama are: *La tragédie française au XVI<sup>e</sup> siècle* (1883); *Le théâtre contemporain* (1888-90), a collection of dramatic criticisms; *Drame ancien, drame moderne* (1898); *Propos de théâtre* (1903-10). English translations of his *Initiation into Literature* and *Initiation into Philosophy* appeared in 1914.

**FAILURES.** See **FINANCIAL REVIEW**.

**FALKLAND ISLANDS** (the *Islas Malvinas* of the Spaniards). A British colony composed of a group of islands in the South Atlantic. They are East Falkland (3000 square miles), West Falkland (2300), and about 100 smaller islands (totaling about 1200 square miles). South Georgia, a group of islands, 54½° S., with an area of about 1000 square miles, a great whaling station, is a dependency of the Falkland Islands. Inclusive of South Georgia the population numbered in 1911, 3275 (2370 males and 905 females). Estimated population, Dec. 31, 1913, 3223. Sheep farming is the sole industry of the colony. Hides, skins, horns, hoofs, bones, tallow, wool, and guano are the exports. Imports and exports for 1914 were valued at £233,379 and £1,505,464 respectively. Total tonnage entered and cleared, 518,144. Revenue, 1914, £2,932; expenditure, £36,046. There is no public debt. The only town is Stanley, with about 950 inhabitants. Dependencies besides South Georgia are the South Shetlands, Graham's Land, the South Orkneys, and the Sandwich group.

**FARM CREDIT.** See **AGRICULTURE**.

**FARM DEMONSTRATION WORK.** See **AGRICULTURAL EXTENSION WORK**.

**FARMERS' INSTITUTES.** See **FOOD AND NUTRITION**; **STOCK RAISING AND MEAT PRODUCTION**; **UNITED STATES DEPARTMENT OF AGRICULTURE**.

**FARMING.** See **AGRICULTURE**.

**FARM LOAN BANKS, FEDERAL.** See **AGRICULTURAL CREDIT**.

**FARM MANAGEMENT DEMONSTRATIONS.** See **AGRICULTURAL EXTENSION WORK**.

**FARTHER INDIA.** See **INDO-CHINA**.

**FEDERAL AID ROADS.** See **ROADS AND PAVEMENTS**.

**FEDERAL CAPITAL TERRITORY.** A territory of the Commonwealth of Australia, situated within the State of New South Wales. The area is 912 square miles. The 1911 census showed a population of 1714 (992 males, 722 females); estimate of June 30, 1915, 2738. The territory was acquired from New South Wales in 1910 as the site of the permanent federal capital, which is named Canberra. The expenditure for development up to June 30, 1914, was £477,943. The great European war caused the work to be delayed, and the architectural competition for the federal parliamentary buildings was withdrawn until a more favorable opportunity.

**FEDERAL COUNCIL OF THE CHURCHES OF CHRIST IN AMERICA.**

The council officially unites in its activities 30 Protestant denominations, including 140,000 churches, with about 18,000,000 members. Its purpose is to unify the work of the Protestant churches in coöperation. It is authorized to voice the conscience of the Protestant churches on important matters and, within proper limitations, to act for them, without, however, interfering with their autonomy. Its national of-



fers constitutes a general Protestant headquarters and clearing house.

The lines of activity are indicated by the names of the commissions, which consist of about 100 members each, nominated by the 30 constituent bodies as follows: The Commission on the Church and Social Service, for action upon social questions in the light of Christian principles; Commission on Evangelism, for united evangelistic work regulated by the churches; Commission on the Church and Country Life, for the conservation and development of rural churches; Commission on International Justice and Goodwill and Commission on Relations with the Orient, cooperating with the World Alliance for Promoting International Friendship through the churches, for the purpose of influencing international relations by the application of Christian principles; Commission on Christian Education, for bringing into cooperation all the educational boards of the churches for the consideration of such common matters as religious instruction in connection with the public schools; Commission on Temperance; and also special committees on Foreign Missions and on Family Life and Religious Rest Day.

The Home Missions Council brings together the various home mission boards in the interest of effective distribution of missions and churches, and the Commission on Inter-Church Federations is engaged constantly in organizing federations of churches in local communities.

In addition to the work of these commissions during the year 1916, important special movements, including a campaign for the conservation of human life, the institution of temperance work among workingmen, a nation-wide movement for war relief and financial assistance for suffering churches in France and Belgium, were carried on. In the interest of temperance, the council's commission has united with the historic National Temperance Society for an educational campaign, publishing three temperance periodicals. The council maintains a publication department which, during 1916, published and sent out over a million books and pamphlets relating to the unified work of the churches in the council. The various YEAR BOOKS issued contain complete ecclesiastical information and statistics.

The quadrennial meeting was held at St. Louis in December, bringing together 400 official representatives of the 30 denominations, which reviewed reports of the secretaries and commissions amounting to six volumes. Messages were received from the churches in the belligerent countries to which appropriate response was made by cable and wireless. The council maintains a staff, in addition to the general secretary, Rev. Charles S. Macfarland, consisting of seven field and executive secretaries. The national office is in New York, and an office is also maintained in Washington and in several other cities.

**FEDERAL RESERVE SYSTEM.** See BANKS AND BANKING.

**FEDERAL TRADE COMMISSIONS.** See TRUSTS.

**FEDERATED MALAY STATES.** A British Malaysian protectorate composed of four states as follows (area in square miles, population, census of 1911):

	Sq. m.	1911	Capital
Perak .....	7,800	494,057	Taiping
Selangor .....	8,156	294,035	Kuala Lumpur
Negri Sembilan ..	2,550	130,199	Seremban
Pahang .....	14,000	118,708	Kuala Lipis
F. M. S. ....	27,506	1,039,999	Kuala Lumpur

A table of commercial and financial statistics follows, values in Straits Settlements dollars (1 Straits Settlements dollar = \$0.56776), for 1914.

	Imps.	Exps.	Rev.	Expend.
Pk. ....	28,940,809	59,000,092	19,338,374	28,861,921
S. ....	34,956,124	46,534,659	13,833,880	20,197,593
N. S. ...	6,068,423	11,886,474	2,580,617	3,801,602
Pg. ....	3,816,328	6,021,594	1,557,072	2,648,921

Railway lines in operation (1914), 771 miles, including 37 miles opened in 1913. The Railways Administration controls the line in the Malay Peninsula, including the Johore State Railways, leased since January, 1912.

Tin and rubber are the chief products for export. In the production of tin the Federated Malay States stand first among the countries of the world. A high commissioner administers the protectorate.

**FEDERATION OF CATHOLIC SOCIETIES, AMERICAN.** See ROMAN CATHOLIC CHURCH.

**FEDERATION OF LABOR, AMERICAN.** See LABOR, AMERICAN FEDERATION OF.

**FEMINISM.** See WOMAN SUFFRAGE; WOMEN IN INDUSTRY.

**FENCING.** The twenty-third annual intercollegiate fencing tournament was won by the United States Naval Academy for the second year in succession. Yale was second and Columbia third. The Navy was victorious in 36 matches, losing only 9. Yale won 28 and lost 17. The standing of the other teams was: Columbia won 23, lost 22; Cornell won 19, lost 26; Harvard won 18, lost 27; Pennsylvania won 10, lost 35. The individual winners were: foils, L. Mouquin, Columbia; sabres, C. De V. Headlee, United States Naval Academy.

Dual college competitions resulted as follows: Navy, 8, Harvard, 1; Navy, 8, Cornell, 1; Pennsylvania, 5, Harvard, 4; Yale, 5, Harvard, 4; Yale, 9, Springfield Y. M. C. A. College, 0.

In the national championships held by the Amateur Fencers' League of America, A. E. Sauer of the Illinois A. C. won with the foils and Sherman Hall of the New York A. C. with the sabres. The women's championship with the foils was captured by Mrs. C. H. Voorhees of the New York Fencers' Club.

**FERGUSON, JAMES E.** Reflected Democratic Governor of Texas, Nov. 7, 1916.

**FERGUSON, SAMUEL DAVID.** An American Protestant Episcopal bishop, and the first negro bishop of his church, died in Monrovia, Liberia, West Africa, Aug. 3, 1916. He was born at Charleston, S. C., in 1842, but when six years old was taken by his parents to Liberia. There he received an education in the mission schools, and after being appointed a teacher, began to study for the ministry. In 1865 he became a Protestant Episcopal deacon, and in 1868, priest. By 1884 he had become so well known for effective service that he was elected by the House of Bishops, sitting in

New York, missionary bishop of Cape Palmas and its adjacent territory. The diocese was later known as that of Liberia and West Africa. In 1885, the year of his consecration in Grace Church, New York, Bishop Ferguson received the degree of D.D. from Kenyon College, and in 1893 the degree of D.C.L. from Liberia College. His tact when attending the Episcopal tercentennial celebration in Richmond, Va., saved him from arousing Southern race prejudice; although Bishop Potter was bitterly criticised for inviting Bishop Ferguson to dine with him at that time.

**FERMENTED LIQUORS.** See LIQUORS.

**FERNALD, BEET M.** Elected Republican United States Senator from Maine, Sept. 11, 1916.

**FERNÁNDEZ DE BÉTHENCOURT, FRANCISCO.** See SPANISH LITERATURE.

**FERRO ALLOYS.** See METALLURGY.

**FERTILIZERS.** At the beginning of the year 1916 the fertilizer situation was distinctly bad from the farmer's standpoint. There was a shortage of supply of the principal fertilizing materials, nitrate of soda, acid phosphate, and especially potash salts, and the prices of these and most other materials as well as the mixed fertilizers prepared from them were as a rule abnormally high.

**POTASH.** There was no improvement during the year as regards the supply of potash for fertilizing purposes. Potash salts could not be secured at prices warranting their use in agriculture, although there was a sharp decline in the price of muriate and sulphate of potash in the New York market during the year. Fewer brands of mixed fertilizers contained any potash and the percentage was very small (usually not more than 1 per cent) in those which contained it. Nothing approaching complete statistics of the production and consumption of potash has been available since 1914, in which year the world's consumption was 8,225,253 metric tons of pure potash, as compared with over 10,000,000 tons the previous year. Of the potash consumed in 1914, 6,569,374 tons were used in Europe and 1,577,867 tons were used in America, the greater part, 1,524,992 tons, in the United States. Attempts were made to meet the shortage of potash by methods of soil management which draw upon the reserves or accumulated potash in the soil and by careful utilization of all waste and other materials containing appreciable amounts of potash. Efforts to develop a domestic potash supply in the United States were continued and progress was made in the production of potash from alunite and Pacific kelps. Eight plants, varying in cost from \$50,000 to \$2,000,000, are reported to have been engaged in extracting potash from kelp in southern California during the year, with a total daily harvesting capacity of 2500 tons of wet kelp. These plants are engaged in the extraction of potash without any regard to the by-products. With present prices this is considered profitable, but might not be under normal conditions. In anticipation of a return to such conditions the United States Congress has appropriated \$175,000 to the Department of Agriculture for experiments to demonstrate the commercial and economic feasibility of producing potash as well as useful by-products from kelp, and it is proposed to establish a plant

capable of handling at least 200 tons of raw kelp per day on the coast of southern California. Improvements of methods of preparing soluble potash salts from feldspar, by which it is claimed muriate of potash of good quality can be made at a reasonable cost, were reported during the year, as were also significant experiments by G. André in France, which showed that about 10 per cent of the potash of glauconite was rendered soluble by prolonged grinding in water with the addition of ammonium sulphate, over 7 per cent with sodium nitrate, and over 5½ per cent with calcium carbonate, sodium chlorid, and calcium sulphate. Simply grinding in water rendered 3.24 per cent of the potash soluble. Somewhat lower figures were obtained in the case of feldspar. In line with the policy of recovering potash from by-products or waste products, electrical devices were successfully installed in several cement works for extracting potash from fumes. A similar method was tested in a large iron and steel works.

**NITROGEN.** The output of nitrate of soda began to increase during the last half of 1915 and in 1916 reached a condition more nearly approaching the normal than has been the case since the European war began. The increased output, however, was used mainly for industrial purposes, and prices rose in all countries except the United States. Here the price remained practically constant during the first half of the year. The production during this period was 1,488,792 metric tons, as compared with 587,876 tons for the corresponding period of 1915. The stocks on hand in Chilean ports June 30, 1916, were 919,102 tons, nearly 100,000 tons more than at the corresponding date in 1915. The imports of the United States during the first half of 1916 amounted to 631,854 tons, more than three-fourths of the total output for 1915. European and Egyptian imports were 776,169 tons for the first half of 1916, as compared with 891,126 tons for the whole of 1915. Imports of certain countries fell off; for example, Russia imported less than during the previous year, and this mainly for industrial purposes, ammonium sulphate being substituted to a considerable extent for the nitrate for agricultural purposes. In Germany the Chilean nitrate formerly used was replaced by ammonium sulphate and synthetic nitrogen compounds, the manufacture of which was so developed as to make that country apparently independent of the rest of the world for nitrogen compounds for both industrial and agricultural purposes. While complete statistics of ammonium sulphate production during the year are not available, the indications are that it materially increased although prices steadily rose. In view of the uncertainty as to a sufficiency of the supply for domestic purposes Great Britain suspended export of ammonium sulphate during the year. From the limited data available it appears that the quantity of synthetic nitrogen compounds available for agriculture was considerably reduced in 1916, due either to reduction of output, as in Norway, or to the reservation of the output for other purposes than agriculture, as in France and Italy. In the National Defense Bill approved June 3, 1916, the United States Congress appropriated \$20,000,000 for the establishment of a plant for the manufacture

under government ownership and control of nitrogen compounds for use in the making of munitions of war, fertilizers, and other useful products. Search for natural deposits of nitrates in the United States was continued, with disappointing results.

**PHOSPHORIC ACID.** No statistics of the output of phosphates in Europe in 1915 and 1916 are available. The output of the United States in 1915 was 1,865,124 metric tons. This represents a decided falling off, which continued into 1916. The Algerian output during the first six months of 1916 was 162,837 tons, as compared with a total output of 165,433 tons in 1915. The Tunisian output for the first three months of 1916 was 224,345 tons, not materially different from that for the same period of 1915. The total output of Tunis in 1915 was 1,389,074 tons. Prices for raw phosphate remained quite constant in the United States and England, but increased decidedly in many other countries. There was a slight falling off in the production and increase in the price of superphosphate, due to increased cost of mining and transporting the raw phosphates and the higher price of the sulphuric acid used in their manufacture.

**MANURE.** The shortage and high price of other fertilizers is emphasizing the value of barnyard manure and the importance of conserving and using to good advantage this great farm resource. It is being valued now as never before as a carrier of plant food, especially potash and nitrogen. Its preservation, economical use, and intelligent supplementing with commercial fertilizers and green manures are now receiving special attention. This is particularly important in view of the fact that the supply of manure is not keeping pace with the demand for it.

**PEAT.** The necessities of the present agricultural situation have also accentuated interest in the utilization of peat as a fertilizer and have drawn attention especially to means of increasing its value as a source of nitrogen. Many experiments with so-called "bacterized peat" were reported during the past year. The essential features of the process by which this material is prepared are (1) treatment with a culture of so-called "humating" bacteria and incubation at a constant temperature for a week or 10 days to produce soluble humates to serve as food for the nitrogen-fixing organisms, (2) destruction of the humating bacteria by sterilization with live steam, (3) treatment of the sterilized peat with a mixed culture of nitrogen-fixing organisms and incubation at 20° C. for a few days, after which the material is ready for use. Analyses indicate that the amount and availability of the nitrogen is decidedly increased by this process, although the composition appears to be quite variable. The material has been shown to have considerable fertilizing value. Its practical value, however, will depend upon whether it can be produced at a sufficiently low price to compete with other similar fertilizing materials.

**GENERAL.** The great lesson of the present fertilizer situation is that the conservation of soil fertility and the utilization of all available fertilizer resources are fundamental duties, and that all the resources of science and of successful practice should be brought to bear

upon this problem. To this end it was suggested, as an outcome of a conference in 1916 of directors of experiment stations in the Northeastern States, that farmers should give greater care than ever before to (1) the selection of soils for crops; (2) the management of soils so as to utilize to the fullest possible extent the plant-food supplies already in the soil; (3) the conservation and utilization of all sources of plant-foods produced on the farm; (4) the selection of such commercial plant-food materials as are most economical; (5) careful study of the plant-food needs of different crops; (6) precautions to be observed in purchasing fertilizers." That a high level of production can be maintained with a scientific use of fertilizers is abundantly proved in the case of Germany, the chief immediate cause of whose increased agricultural productivity, especially in recent years, is the increase in use of artificial fertilizers scientifically applied. Impressed by this fact, the British Board of Agriculture has strongly urged a similar policy of liberal but discriminating use of fertilizers. In the United States a prominent and successful feature of the agricultural extension work is a campaign to bring about more effective and economical use of fertilizers. See **CHEMISTRY, INDUSTRIAL; SOILS.**

**FESTIVALS, MUSIC.** See **MUSIC.**

**FICTION.** See articles on French, German, Italian, Russian, Scandinavian, and Spanish literatures; **LITERATURE, ENGLISH AND AMERICAN.**

**FIJI ISLANDS.** A group of South Pacific islands; a British crown colony. Total area, including the dependency of Rotumah (14), is 7435 square miles. Estimated population, Dec. 31, 1913, 153,704. Sugar, copra, and fruit (particularly pineapples) are the chief products and exports. Total imports, 1914, £911,274; exports, £1,389,565. Suva, the capital, has cable communication with Brisbane and with Canada. Revenue, 1914, £279,845; expenditure, £301,352. Public debt, £60,715.

**FILTRATION.** See **WATER WORKS AND WATER PURIFICATION.**

**FINANCIAL REVIEW.** This topic includes a statement of the general features of business conditions during the year, together with a treatment of such special topics as stock exchange, foreign trade, bank clearings, failures, and business conditions in particular countries. Additional information relating to trade and finance will be found under the following topics: **AGRICULTURAL CREDIT, BANKS AND BANKING, INSURANCE, NATIONAL BANKS, PRICES, TARIFF, TAXATION, TRUSTS.** See also the article **LABOR** and references there given, articles on various countries and States of the United States.

**GENERAL CONDITIONS.** Although the preceding year had been one of superlative business developments in the United States, Canada, and Japan, it was surpassed by the industrial and trade activity of 1916. This was in part due to foreign demand due to the war, although estimates of the proportion of American business due to the war ranged from 50 per cent down to 10 per cent. The year opened with all lines of business running at nearly full capacity; there was a slackening of demands and slight unsettlement during the summer, but this was followed by renewed activity on an enlarged scale in the fall and

early winter. The statistics given in the following paragraph indicate some of the year's achievements. The volume of exports was one of the most astonishing results of the year's trade, but imports also reached an amount hitherto unattained, in spite of the fact that several countries with which American trade had, before the war, been extensive, were practically excluded from our markets. The volume of domestic trade likewise reached, according to an estimate in the *New York Times Annalist*, the prodigious sum of \$45,000,000,000, as compared with \$32,000,000,000 in 1915 and \$30,000,000,000 in 1914. In consequence the railway embargoes which had been instituted late in 1915 were again imposed at various times with restriction of production in various industries. During the early months of the year the car shortage was not serious and on August 1st there was a small surplus of 9700 freight cars out of the country's total of 2,000,000; but on September 1st the shortage was 19,800; it had risen on October 1st to 60,700; while on November 1st it was 108,000. A favorable factor as regards foreign trade, however, was the reduction in ocean freight rates and the availability of greater tonnage. Reduction in these rates amounted from 40 to 50 per cent toward the close of the year. In some cases there was a shortage of materials, while in many places all available labor was utilized and more was demanded at advancing wages. (See UNEMPLOYMENT.) Prices of materials generally advanced. (See PRICES.) Enormous gold importations were at the basis of this rapid upward movement of prices and a great expansion of bank credits. During 1915 the stock markets had absorbed about \$1,000,000,000 of American securities previously held abroad, and American banking institutions and investors had extended through bonds and notes credits of an equal amount to foreign governments; these remarkable phenomena were repeated in 1916. These transactions were, however, merely an indication of the enormous volume of investment transactions. Stock speculation for the year was surpassed only in 1906, while bond sales were exceeded only in 1909. Commercial failures were relatively few and liabilities relatively small. Bank clearings reflecting the unparalleled volume of domestic trade greatly exceeded those of any preceding year.

**STATISTICS.** The agricultural crops were somewhat smaller in amount than in 1915, but nevertheless, on account of the unusual world demand, represented a greater value. The total value of all farm products was finally estimated at a gross value of \$13,449,000,000, exceeding the total value in 1915 by \$2,674,000,000, and that of 1914 by \$3,500,000,000. This value was double that of 1905. Iron ore mined totaled 75,500,000 tons, or 20,000,000 tons more than in 1915. Coal mined aggregated 597,500,000 tons; coke produced, 54,300,000 tons; pig iron production was 39,500,000 tons, or nearly 10,000,000 tons greater than in 1915 and exceeded the previous maximum of 1913 by 8,600,000 tons. Of copper approximately 2,300,000,000 pounds were produced, being an increase of 41 per cent over the preceding year. The gross earnings of railways aggregated \$3,753,000,000, an increase of 18 per cent over 1915; their net earnings, \$1,136,

000,000, an increase of 26 per cent. Building expenditures for the year were estimated by *Bradstreet's* at \$1,000,000,000, or 10 per cent greater than in 1915. The unfilled orders of the United States Steel Corporation at the close of the year were 11,058,000 tons, an increase of 35 per cent, as compared with 1915. Petroleum production amounted to 292,300,000 barrels, an increase of 4 per cent. There were built 135,000 freight cars and 4075 locomotives, increases respectively of 82 per cent and 95 per cent. Railway receiverships decreased from the previous year 80 per cent in mileage and in capital involved; but railway foreclosure sales increased 114 per cent in mileage and 146 per cent in capital involved. It was estimated that the tonnage built in American ship yards in the first 11 months was 522,000, an increase of 114 per cent, while a similar percentage increase was represented by the 1,500,000 automobiles estimated to have been built. The labor employed in the cotton industry was approximately the same in November, 1916, as in January, 1915, but the payroll had increased 17 per cent; for these same dates the woolen industry showed an increase of 17 per cent in number of employees and 44 per cent in payroll; boots and shoes an increase of 15 per cent in number of employees and 41 per cent in payroll; while iron and steel showed an increase of 58 per cent in number of employees and 124 per cent in wages paid. The *Journal of Commerce* reported that the January, 1917, dividend and interest payments of American railway, traction, and industrial companies, and the Federal and New York City governments aggregated \$330,517,000, an increase of \$49,317,000 over January, 1916.

**STOCK OF GOLD.** On Jan. 1, 1917, the stock of gold money in the United States was approximately \$2,850,000,000, or \$27.60 per capita. There were gross imports during the year of 1916 amounting to \$680,000,000 and exports of \$150,000,000, or net imports of \$530,000,000, nearly \$6 per capita. The gross imports since July 1, 1914, totaled \$1,150,000,000; and net imports, \$855,000,000. The total stock of gold money in the United States, including the output of American mines, had increased from July 1, 1914, by nearly \$1,000,000,000, or at least \$9 per capita. This immense quantity of gold was believed to be a menace to American industrial and commercial peace. About two-thirds of it had been added to banking reserves and the remainder to free circulation. An abundant supply of gold prompts bankers to unduly expand credits, and it leads them to invest too freely in non-liquid securities. These tendencies were shown during 1916. But doubtless one of the most deplorable and far-reaching effects was an increase of prices during the year of about 28 per cent (see PRICES). Moreover, the inevitable exportation of gold at the conclusion of the war might easily produce startling reductions in credits and in prices.

**FOREIGN TRADE.** The total imports from abroad during 1916 were approximately \$2,350,000,000, an increase of 32 per cent over 1914 or 1915; total exports were \$5,475,000,000, an increase of 54 per cent over 1915 and of 159 per cent over 1914. The greatest volume of imports in any preceding calendar year had been \$1,818,000,000 in 1912, while the greatest

volume of exports previously had been in 1915. These results were attained in spite of the fact that trade with central European powers was only \$35,000,000, or 5 per cent of the normal amount; and in spite of a reduction of more than \$150,000,000 in the normal volume of purchases from the rest of Europe. The following statistics refer to the first 10 months. During this time our purchases from Canada, Cuba, and Mexico were \$170,000,000 above the pre-war average; those from South America were \$160,000,000 greater; those from Asia, \$200,000,000 greater; those from Oceania, \$40,000,000 greater; and those from Africa, \$40,000,000 greater. The principal items producing these increases were Cuban sugar, Canadian manufactures, South American coffee, cacao, rubber, wool, and hides, and Oriental silk, hides, rubber, and fibres. Crude manufacturing materials imported alone showed an increase of \$300,000,000, as compared with the first 10 months of 1914; partly manufactured foodstuffs showed an increase of \$70,000,000 for that period; and partly manufactured materials for use in further manufacture, an increase of \$100,000,000.

The exports were increased only in moderate proportion by the war exportations to Europe. Principal items of exports for the first 10 months were as follows, together with the percentage increase or decrease in comparison with 1915: brass, \$263,000,000, 592.0 per cent increase; wheat and flour, \$243,000,000, 26.5 per cent decrease; all breadstuffs, \$377,000,000, 18.2 per cent decrease; copper, \$188,000,000, 102.0 per cent decrease; cotton, \$395,000,000, 12.5 per cent increase; explosives, \$582,000,000, 430.0 per cent increase; iron and steel, \$701,000,000, 138.0 per cent increase; meat and dairy products, \$253,000,000, 9.0 per cent increase; horse and mule, \$74,000,000, 29.0 per cent decrease; automobile, \$100,000,000, 6.3 per cent increase; chemicals, etc., \$134,000,000, 120.0 per cent increase; coal, \$80,000,000, 9.5 per cent increase; cotton goods, \$107,000,000, 35.0 per cent increase; leather and manufactures, \$130,000,000, 3.8 per cent decrease; oil, mineral, \$171,000,000, 46.1 per cent increase. While exportations to Europe were most unusual, those to the rest of the world doubled during the two years 1915 and 1916. Great Britain alone purchased nearly \$2,000,000,000 worth of goods; France, about \$950,000,000; Canada, \$600,000,000; Russia, \$140,000,000; South America, \$197,000,000; and Cuba, \$145,000,000. Moreover, the proportion of exports represented by food products continued to diminish while the proportion represented by manufactures rapidly increased. It must be noted that an important factor in the tremendous increase in the value of imports and exports was the rapid rise of prices.

**STOCKS AND BONDS.** The transactions just mentioned, together with the great outburst of domestic trade, furnished an adequate basis for immense speculative and investment movements. Moreover, money was abundant, call loans seldom reaching 3 per cent and time loans being usually 4 per cent or less. Stock markets throughout the country reported unusual transactions and a very widespread participation of the public. At New York stock shares traded aggregated \$230,060,000, an amount exceeded only in 1906, and 32 per cent above the sales of 1915. Bond transactions totaled \$1,134,000,000, or 18 per cent above the 1915 total and not ap-

proached except in 1908 and 1909. There was uncertainty at the beginning of the year due to German submarines and the Mexican situation, with the result that the low ebb of the year was reached in April, when 50 leading stocks averaged 80.91. The great increase in reported earnings of railways and industrial companies brought improvement in the summer, and some advance in prices resulted from the decision of the British government to use their holdings as collateral rather than to sell them. Following the settlement of the railway difficulties in September, there occurred a very unusual stock market boom. This raised the prices of all stocks but greatest activity prevailed in American industrials and railroads, rather than in war stocks. Sixty-nine days of the year showed transactions in excess of 1,000,000 shares. On November 20th the above 50 stocks showed an average of 101.51, but sharp declines accompanied the warning of the Federal Reserve Board against foreign notes (see **BANKS AND BANKING**), Germany's peace proposal, and President Wilson's note of December 18th. In consequence these 50 stocks showed an average price of only 88.72 on December 29th.

**BANK CLEARINGS.** As was to be expected from the great volume of business, the bank clearings of the country reached an amount hitherto unattained. For the calendar year, clearings of 152 American centres aggregated \$259,965,000,000, an increase of 39 per cent over 1915, which was the previous maximum, and an increase of 68 per cent over 1914. Of this enormous aggregate New York City was credited with \$159,580,000,000, which was 44.7 per cent greater than the New York clearings of 1915, and 92 per cent greater than those of 1914. Outside of New York the aggregate was \$100,388,000,000, or 31 per cent more than in 1915 and 41 per cent more than in 1914. Every large city of the country reported an increase in the volume of bank clearings. The clearings for all cities by months, in millions of dollars, were as follows: January, \$20,011; February, \$18,185; March, \$20,618; April, \$19,251; May, \$20,564; June, \$20,526; July, \$19,307; August, \$19,685; September, \$22,677; October, \$25,491; November, \$26,610; December, \$27,075. The increases by different sections of the country, reflecting the increases in business transactions were as follows: New England, 30.3; Middle, 44.1; Western, 42.7; Northwestern, 25.1; Southwestern, 29.5; Southern, 28.1; Far-Western, 36.6. The total clearances in millions of dollars for principal cities other than New York were as follows: Chicago, \$20,541; Philadelphia, \$13,083; Boston, \$10,756; St. Louis, \$5370; Pittsburgh, \$3402; Kansas City, \$4953; San Francisco, \$3479; Baltimore, \$2206; Detroit, \$2260; Cincinnati, \$1747; Minneapolis, \$1469; Cleveland, \$2473; Los Angeles, \$1292; New Orleans, \$1381; Omaha, \$1279; Milwaukee, \$1947; and Atlanta, \$1013. In December for the first time total clearances outside of New York exceeded \$10,000,000,000.

*Canadian Clearances* likewise established a new record, with a total of \$10,315,000,000, an increase of 34.7 per cent over 1915 and of 30.4 per cent over 1914. Of the total, Montreal was credited with \$3,715,000,000, Toronto with \$2,571,000,000, and Winnipeg with \$2,061,000,000.

**FAILURES.** The year was one of such unprec-

edented industrial prosperity that failures were fewer than in 1915 and also in 1914. Not only was there a decrease in numbers, but there was an even greater decrease in liabilities. According to *Bradstreet's* the number of failures was 16,498, or 13.3 fewer than in 1915. Liabilities aggregated \$170,752,000, or 40 per cent less than in 1915, and the smallest in a decade, except in 1909. Every group of States except the Northwest, where there was a failure of the wheat crop, showed a decrease both in the number of failures and in liabilities. The proportion of assets to liabilities was only 48 per cent, being the smallest proportion since 1902. The business death rate was 0.91 per cent, as compared with 1.07 per cent in 1915 and 0.95 per cent in 1914.

*Canadian Failures* numbered 1772, with total liabilities of \$15,952,000 and total assets of \$6,349,000. In comparison with 1915, there was a decrease of 32 per cent in the number and of 50 per cent in the total liabilities.

**FOREIGN EXCHANGES.** The unprecedented volume of the foreign trade of the United States, Great Britain, and France and the unbalanced character of this trade created serious problems for bankers dealing with the settlement of international balances. The tremendous excess of American exports made it necessary for the first time that large credits be established in New York for Great Britain and France. In consequence, exchange on New York became a readily available medium of international trade throughout the world. This "dollar exchange" had become so important by the close of 1916 that international bankers found its volume to be approximately equal to the volume of sterling exchange. Thus New York temporarily tended to become an international banking centre of equal importance with London. As the United States became the greatest creditor nation in the world's trade it repurchased \$2,000,000,000 of American securities previously held abroad, increased its gold holdings to a prodigious sum, while in addition hundreds of millions of dollars of securities owned by British subjects and mobilized by the British government were on deposit in New York as security for extensive loans. These loans in fact were only a small proportion of the total loans extended to foreign governments, including those of Canada, Russia, France, French cities, Argentina, and China, by American investors during the year.

At the close of the year the principal exchanges showed the following percentage discounts at New York: Sterling, 2.2; francs, 12.6; marks, 24.1; kronen, 40.9; lire, 33.2; ruble, 41.3. There was a slight premium on Holland and Swiss exchange, as also upon Argentine exchange; but that upon Rio de Janeiro was at a discount of 26.2 per cent.

**BLACKLIST.** A war measure very directly affecting United States trade was the publication on July 18th of a blacklist of 82 American business firms and individuals by Great Britain. These were chiefly German firms with head offices in Germany, or German firms incorporated in the United States. But the scope and effect of the policy was unusual. Not only were financial and commercial dealings forbidden between citizens of Great Britain and the firms on the list, but Americans doing business in foreign countries received notice that their dealings with the blacklisted firms were to be regarded

as subject to veto by the British government. Moreover, from fear of consequences, neutral bankers refused loans to those on the list and neutral merchants declined to contract for their goods. British steamship companies would not accept cargoes from the proscribed firms or persons, or transport their goods to any port. Steamship lines of neutral ownership accepting freight from these firms were threatened with refusal to permit coaling at British ports, with exclusion from other privileges, and with probable addition to the blacklist themselves.

Protest in regard to this action of the British government was filed in London by Acting Secretary of State Frank L. Polk on July 27th. The protest, after reciting the above-noted consequences of the blacklist, maintained that citizens of the United States were entirely within their rights in trading with peoples or governments of any nation at war and were subject only to practices of international law; and that "neutrals may not be condemned nor their goods confiscated except upon fair adjudication and after an opportunity to be heard in prize courts." The note of protest concluded that the United States manifestly could not be expected to "acquiesce in such methods or applications of punishment to its citizens."

The reply of Sir Edward Grey to this protest, dated October 10th, was considered a most effective legal argument, but was not fully satisfactory to American opinion. He described the blacklist as "a piece of purely municipal legislation," that is, relating solely to internal government, and consequently applying only to British subjects. The purpose of the blacklist was to forbid such subjects from trading with the blacklisted persons, who in this case happened to be domiciled in the United States, but who were rendering service to the enemy. He gave assurance that the prohibitions would "not be carried further than is absolutely necessary," nor would it be permitted to interfere with genuinely neutral trade. At the same time Lord Grey defended the so-called "Bunker Coal Agreement." This related to a rule authorizing the supplying of coal in British ports only to ships agreeing not to carry goods belonging to blacklisted firms. The British note caused considerable offense by the assertion that "no adequate action has yet been taken by the Government of the United States to suppress criminal breaches of neutrality" by German-Americans. Newspaper comment was much divided on the soundness of Sir Edward Grey's defense of the blacklist, but there was general resentment to this affront to the American government.

**WAR AND FINANCE.** The war, of course, constituted the most important single element in the world's financial year. It was computed that the direct money cost of the war up to the close of 1916 was more than \$61,000,000,000 and that the expenditures were then occurring at the rate of \$105,000,000 per day. In this total the Entente Allies were charged with more than \$41,000,000,000, and the Central Powers with the remainder. The total cost to the different Allies up to the close of 1916 was approximately as follows: United Kingdom, \$14,374,000,000; Canada, \$400,000,000; other British colonies, \$600,000,000; France, \$12,200,000,000; Russia, \$8,500,000,000; Italy, \$4,000,000,000; Belgium, \$490,000,000; Serbia, \$330,000,000; Rumania, \$250,000,000; for the Central Powers, the cost

to Germany was \$14,600,000,000; to Austria, \$5,000,000,000; Turkey, \$650,000,000; Bulgaria, \$375,000,000. Of the daily cost, two-thirds was borne by the Entente and one-third by the Central Powers. Most of these vast sums were raised by the issue of government bonds and notes, most of which are listed below.

The Federal Reserve Board estimated the increases in the indebtedness of Great Britain, France, Russia, Germany, and Austria-Hungary at \$49,455,000,000, from the beginning of the war. This was divided as follows: Great Britain, to November, 1916, \$13,253,358,000; France, to September, 1916, \$8,038,500,000; Russia, to Dec. 31, 1916, \$7,973,274,000; total for these Allies, \$29,265,132,000; Germany, to Oct. 27, 1916, \$15,260,000,000; Austria-Hungary, to May, 1916, \$5,930,000,000. Great Britain's debt increased from \$3,450,000,000 in March, 1914. Russia's debt rose from Rs. 9,888,310,000, Jan. 1, 1914, to Rs. 25,220,936,000 in December, 1916.

**GREAT BRITAIN.** The financial and industrial preeminence of England never showed to greater effect than during 1916. Not only did she finance the greatest military expenditures the world has ever seen, but she retained very fully her command of various foreign markets in international trade and offset the largest unfavorable trade balance any nation has ever known. Many of her industries were carried on at a maximum capacity while others inevitably languished. Labor, as in all industrial nations, was relatively scarce, as were various materials, and wages and prices rapidly advanced. One evidence of the enormous volume of business was the total of £15,275,000,000 of bank clearings, an increase of £1,667,000,000 over 1915. Nevertheless there was a general decline in the market value of British securities; this decline, however, was almost negligible in comparison with that of the two preceding years and was in part compensated by the advance in the stocks of companies deriving benefits from the war. The *Bankers' Magazine* reported that the aggregate decline in market values of 387 issues from July 20, 1914 to December, 1916, was from \$18,400,000,000 to \$13,790,000,000. Sixty per cent of this shrinkage, however, occurred in 1914 and three-fifths of the remainder during 1915. The total imports for the year were approximately \$4,745,000,000, an increase of 10 per cent over 1915 and of 33 per cent over 1914. Exports aggregated about \$2,550,000,000, consequently the unfavorable trade balance exceeded \$2,000,000,000. The purchases from the United States alone exceeded \$2,000,000,000. In order to pay for these goods Great Britain continued the policy begun in 1915 of mobilizing securities owned by British subjects and placing these in New York as security for credits advanced by American bankers and investors on the basis of British bonds and treasury notes. By the close of the year over \$800,000,000 of such credits had been extended by America. On August 17th, a two-year 5 per cent loan of \$250,000,000 was announced by J. P. Morgan and Company, the British agents; a second collateral loan of \$300,000,000 at 5½ per cent was brought out in November. Moreover, the exports for the year showed an increase of about \$600,000,000 over 1915, revealing the tremendous effort being made to maintain the British trade position. This increase applied primarily to the trade with India, Dutch

East Indies, Central and South America, Egypt, and China, and related to the various kinds of textiles and iron and steel. Late in the year a Federation of British Industries was formed to deal with the current and after-war trade problems. Moreover, an effort was being made to ferret out all alien trade interests.

The war finances were prodigious. On February 21st the House of Commons voted a war credit of \$2,100,000,000; on May 23rd another credit of \$1,500,000,000; on July 24th another of \$2,250,000,000. On October 11th, the 13th war credit of \$1,500,000,000 was voted, making a grand total for the war of \$15,660,000,000. At the close of the year, however, preparations were being made for a new credit into which most previous loans were to be convertible. This convertibility applied also to treasury bills, of which an aggregate of \$5,540,000,000 had been issued up to December 16th. In announcing the new 1916-17 budget in April, Chancellor McKenna stated that the revenue from taxation for the year should approximate \$2,200,000,000 or \$352,000,000 above 1915-16. He announced that the war expenditures for 1915-16 aggregated \$8,000,000,000 and that this sum would be exceeded in 1916-17 by at least 20 per cent. Up to the close of 1916, however, aggregate loans of more than \$1,000,000,000 had been extended to allies and colonies. Among the principal sources of revenue was a new tax on excess profits, which up to December 16th, had produced \$358,177,000. Other important taxes were those on incomes, import duties on sugar, cocoa, and coffee, and taxation of motor cars, amusements, railway tickets, watches, and mineral waters.

**FRANCE.** The stimulation of industry by war in France was typical, that is, those industries in any way connected with the supply of war materials and all those supplying fundamental needs of the population were greatly stimulated. Labor was relatively scarce and wages and prices advanced rapidly. For the first seven months imports of foods, raw materials, and manufactured products totaled 5,410,000,000 francs and exports 854,000,000 francs. Compared with the same months of 1915 this was an increase of 25 per cent in imports and of over 60 per cent in exports. If to these be added the trade in war supplies, the imports aggregated 10,336,000,000 francs and exports 2,990,000,000 francs; this adverse trade balance of 7,346,000,000 francs was thus at the rate of more than 10,000,000,000 francs for the year. As a means of checking future plans of "economic penetration" steps were taken toward the establishment of a complete registration of every business man in France, including intimate details of his birth, marriage, and family connections. Moreover, at Paris, in the early summer had been held a conference of British, French, and Italian financiers for the consideration of harmonious policies in relation to international trade both during and subsequent to the war. In August the American Manufacturers' Export Association sent a commission to France at the invitation of the French government. It investigated the needs of the country, especially with reference to the reconstructive period following the war.

Problems of war finance were tremendous but readily met. Up to November, 1915, over 21,000,000,000 francs had been raised for war pur-

poses. At that time a new 5 per cent loan was offered to the public. In January, 1916, it was announced that this loan, which was issued at 88, had yielded net proceeds of 13,243,000,000 francs. The cost of the war is shown by the appropriation of 8,173,000,000 francs for the first quarter of 1916; of 7,817,000,000 francs for the second quarter; of 8,511,000,000 francs for the third quarter; and of 8,838,000,000 francs for the fourth quarter. Up to June 30th the total war expenditures were 47,000,000,000 francs: this included, however, nearly 1,000,000,000 francs loaned to Belgium, Serbia, Greece, and Montenegro, and more than 5,000,000,000 for the relief of soldiers' families and other welfare work. Many new taxes were imposed to provide a basis for these loans and other taxes were raised. The new income tax became effective in 1916; new taxes were imposed on house dogs and hunting dogs, while increased taxes were imposed on alcohol, wine, beer, cider, sugar, tobacco, horses, carriages, automobiles, billiard tables, clubs, hunting preserves, and mines.

GERMANY. As in other belligerent countries, the industries of Germany were most of them greatly stimulated by the war, while others were depressed. The latter included primarily those that had previously been engaged in export trade. As elsewhere also, labor was relatively scarce (see UNEMPLOYMENT) and unusual numbers of women were drawn into industrial pursuits. There was a scarcity of many raw materials previously imported; foods were scarce and mostly under governmental regulation (see PRICES); and advancing wages were not sufficient to offset the increasing cost of living. The Berlin Boerse did a reduced volume of business, but the year was marked by various outbursts of speculative interest in stocks of companies affected by the war. Foreign exchange did not constitute an important problem because the volume of imports and exports was small, but much attention was given to the organization of industry and finance, not only to meet the demands of war but in preparation for the return of peace. The German Imperial Commission for the Transition from War Economics to Peace Economics was the most important agency especially designed to marshal the resources of the Empire for an orderly and systematic effort to regain the lost position in world trade. Another very comprehensive agency was the German Industrial Council, embracing nearly the whole of German industry. Its object was "to assure in the future a unified representation of German industry." It was expected that this body and others would not only influence the domestic policies with reference to tariffs, manufacturing, and shipping, but would assist in the recovery of foreign markets throughout the world.

War finance, however, was the most absorbing topic in the financial year. Total war credits voted by the Reichstag up to the close of 1916, were \$16,500,000,000. Of this nearly \$12,000,000,000 had been raised by permanent loans, while the floating indebtedness was estimated at \$4,500,000,000. This latter was represented in the \$635,000,000 of notes issued by the war loan banks (Darlehnskassen), in the increase of \$1,190,000,000 in note circulation of the Reichsbank, and in the advances of this bank which reached a total of \$2,100,000,000. The first four

war loans produced 36,336,000,000 marks. The payment of subscriptions for the third war loan was completed in January. It brought 12,101,000,000 marks from 3,966,000 subscribers. The fourth loan launched the same month in the form of 4½ per cent treasury bills due July, 1932, and 5 per cent imperial bonds due October, 1924, produced 10,712,000,000 marks from 5,279,000 subscribers. Of the subscriptions 2,406,000 were for 200 marks or less, while 1,853,800 other subscriptions ranged from 300 marks to 1000 marks. About 60 per cent of these subscriptions were made through the special war loan banks. By means of these the tangible wealth of the country, including stocks and bonds and all material goods usable by a nation at war, were made available in place of cash for the purchase of government bonds. In the absence of import duties the sources of internal revenue were greatly increased, including a special assessment of 50 per cent on war profits. In spite of the war burdens the age for granting old-age pensions was reduced from 70 to 65 years in January.

RUSSIA. The effect of the war upon the industrial development of Russia was greatly to stimulate nearly every productive activity, and especially to hasten the process of industrialization. In 1916 the regulations for forming joint stock companies were simplified, with consequent increase in the number and capitalization of new corporations. The official balance sheet on the Russian State Bank showed total assets on Nov. 14, 1916, of 11,492,806,000 rubles. This was an increase in 12 months of 4,726,628,000 rubles, due to an increase in the amount of gold held abroad from 130,173,000 rubles, to 2,055,000,000 rubles and an increase in the short term obligations of the Imperial Treasury from 2,319,000,000 rubles to 6,202,000,000. The liabilities, on the other hand, showed an increase in note circulation from 5,040,000,000 rubles in November, 1915, to 8,083,000,000 rubles one year later. An indication of the great prosperity of the country was the increase in the deposits of the State Savings Bank of 1,690,000,000 rubles since Oct. 1, 1914.

Problems of war finance were great. In October, Minister of Finance P. L. Bark announced that the extraordinary expenditures on account of war in 1916 would be 12,870,000,000 rubles, besides 3,390,000,000 rubles for the normal budget. The abolition of the spirit monopoly had removed the most important single source of revenue, but the expansion of industry and the rapid accumulation of wealth made possible new sources of taxation more than sufficient to offset the loss. A new income tax became effective Jan. 1, 1917, and was estimated to yield 130,000,000 rubles the first year. The tax on war profits was expected to yield 55,000,000 rubles. Still more important was the tobacco tax, and the excises on sugar and tea, and of yet greater importance were the import duties, the state railways, and other state properties.

The total debt Jan. 1, 1917, was 25,220,000,000 rubles. This was an increase during 1916 of 6,344,000,000 rubles. This increase took the form of the following loans: Rs. 2,500,000,000 short term notes discounted in Russia; Rs. 1,046,000,000 of the same discounted in England; and a 5½ per cent loan issued in March and due in 1926, amounting to 2,000,000,000 rubles; and



small external loans, mostly in short term notes, sold in France, Japan, and the United States.

**JAPAN.** The war brought an unprecedented era of prosperity to Japan. It began to show its effects in the early months of 1915, the first order for arms and ammunition being placed there by Russia in March. Thereafter not only did the exportation of arms and ammunition increase rapidly, but the export trade with China, India, and Australasia reached unprecedented figures. The total exports for the year ending Sept. 30, 1916, exclusive of over 200,000,000 yen of munitions, amounted to 978,584,000 yen, an increase of 347,000,000 yen over the preceding year. In consequence arsenals, cotton spinning and weaving mills, the leather industry, and various branches of the chemical and dye industries were enormously stimulated. The merchant fleet, which reached the total of 1,885,000 tons, was employed at unusual profits, and ship building yards were working at full capacity. Consequently, banking and commercial transactions extended to a veritable boom. Foreign obligations of Japan were reduced to the amount of 120,000,000 yen, and in addition a credit of equal amount was created in Russia. On Oct. 15, 1916, the Bank of Japan held abroad assets of 450,000,000 yen, as against 220,000,000 yen on June 30, 1914; and in addition in the same period its specie reserve increased 93,000,000 yen. Bank deposits on June 30, 1916, aggregated 3,098,000,000 yen, an increase of nearly 600,000,000 yen for the year. Bank clearings for the year ending in September totaled 17,007,000,000 yen, an increase of nearly 70 per cent over either of the two preceding years. There was unusual activity on the stock exchange, some of the industrial securities affected by the war being quoted at 5 to 20 times their pre-war prices. Japan also found resources and initiative for extending railway construction in Manchuria and Mongolia; in developing steel works, and coal and iron mines in the Yangtzu Valley; and otherwise assisting in the development of the immense resources of China.

**CANADA.** As in the United States, the stimulus of war brought a great outburst of manufacturing and trading activity to Canada. In 1915 the exports exceeded imports by \$142,000,000. In the first eight months of 1916 exports totaled \$675,000,000, or \$80,000,000 more than during the entire year preceding; imports also increased, amounting to \$520,000,000 for the eight months, as compared with \$472,000,000 for the entire year 1915. Thus exports for the year exceeded \$1,000,000,000, or double those of the year before the war; and the unfavorable trade balance of 1913 of \$300,000,000 was turned into a favorable one of equal amount. The largest increases in exports were shown by manufactured goods, agricultural, animal, and mineral products. There was unusual activity in iron and steel, automobiles, textiles, and metal mining and refining. Labor was scarce at advancing wages, and an unusual number of women were drawn into all employments. Railway earnings were greater than ever before. It was anticipated, however, that the return of peace would bring profound changes, and the National Service Committee was formed to organize and classify national resources, encourage efficiency, and direct productive energy

to best channels. In anticipation of still higher tariffs following the war an unusual number of American companies established branches in Canada during 1916.

War finance engaged much attention. The extraordinary expenditures due to the war were about \$400,000,000 for the Dominion and \$100,000,000 for the provinces. The 1916-17 budget included \$250,000,000 for war expenditures. Of this 15 per cent was met by increased taxation. In August, 1914, the Dominion government appropriated \$50,000,000 for military purposes; in February, 1915, \$100,000,000; and in February, 1916, \$250,000,000. To meet these the following loans were made: \$25,000,000, 4½ per cent 1920-25 bonds placed in London in March, 1915; \$45,000,000, 5 per cent gold notes placed in New York, of which \$25,000,000 was redeemed in 1916 through conversion into 20-year Dominion bonds due in 1935; the 5 per cent war loan of 1915 of \$100,000,000 absorbed at home; the 5 per cent war loans of 1916 of \$75,000,000 issued in the United States in serial bonds due 1921-31; and a third 5 per cent war loan of \$100,000,000 issued in Canada in September, 1916. The Canadian government also undertook to establish in Canada credits for the British government to cover war purchases. The first established in 1915 amounted to \$50,000,000; others in 1916 amounted to \$175,000,000. These were offset at first by advances made to Canada by Great Britain represented in the expenditures for Canadian troops on the war front. But in August, 1916, Canada advanced to Great Britain \$100,000,000 of 3½ per cent and 4½ per cent Dominion bonds to defray the European expenses of its troops. These bonds were in turn used by Great Britain for the establishment of credits in the United States.

**SHIP PURCHASE BILL.** During 1915 it had been an important feature of President Wilson's policy to provide by government action additional shipping facilities for American trade. In his message in December, 1915, he urged the passage of a measure to provide for government-owned vessels as a means of restoring "our commercial independence on the seas." In February, 1916, such a bill had passed the House; it was again passed in May, 1916, by a vote of 211 to 161, only 12 Republicans voting in its favor. Both party platforms favored the restoration of American merchant marine, but while the Democrats approved the administration measure, the Republicans favored ship subsidies. The bill finally enacted provided for the creation of a shipping board of five members with extensive powers to regulate commerce at sea and to restrain monopolistic combinations. It was authorized to spend \$50,000,000, to be raised, if necessary, by bonds which the Secretary of the Treasury was given power to issue, for the purchase or construction of merchant ships. If such ships are not sought by private operators then the board is authorized to form a joint stock company to operate them, the government being the principal stockholder.

On December 22nd President Wilson appointed the following to constitute the board: John B. White, Republican, from Kansas City; Theodore Brent, Republican, of New Orleans; William Denman, Democrat, of San Francisco; John A. Donald, Democrat, of New York; and

Bernard M. Baker, Democrat, of Baltimore. They will receive \$7500 per year.

**FINLAND.** A country situated on the Gulf of Bothnia; a grand duchy of the Russian Empire, incorporated with the Empire by virtue of Article IV of the treaty of Fredrikshamn (Sept. 17, 1809). Capital, Helsingfors.

**AREA AND POPULATION.** Area in square kilometers and population by governments, Dec. 31, 1910, follow:

	Sq. km.	Pop.
Nyland	11,872	376,218
Abo-Bjorneborg	24,171	499,332
Tavastehus	21,584	342,821
Viborg	43,055	521,469
St. Michel	22,840	198,829
Kuoplo	42,780	383,777
Wasa	41,711	514,940
Uleåborg	165,641	328,311
Total	878,604*	3,115,197

\* Of which 47,829 sq. kilometers internal waters.

Helsingfors had 161,091 inhabitants in 1912, Abo 52,057, Viborg 28,257, Tammerfors 46,192, Nikolaistad 23,275, Bjorneborg 17,072, Uleaborg 21,271, Kuopio 16,266. Marriages in 1912 numbered 18,653, births, 94,620, deaths, 53,990, stillbirths, 2345.

**PRODUCTION AND COMMERCE.** The principal products for export are shown in the table of commerce below, values for the year 1913 in thousands of marks (gold):

Imports	1000 m.	Exports	1000 m.
Cereals	90,700	Timber	218,800
Machinery	33,100	Paper, etc.	71,300
Iron mfra.	29,100	Butter	85,300
Coffee	22,500	Hides, etc.	11,700
Hides, etc.	21,100	Woolen wares	8,500
Sugar	19,100	Cottons	6,900
Cotton	17,400	Fish	6,200
Fuel	14,900	Horses	4,200

Countries of origin and destination and totals are shown below for 1913, in thousands of marks:

	Imports	Exports
Germany	202,535	52,151
Russia	140,198	113,301
United Kingdom	60,660	108,565
Denmark	28,094	18,326
Sweden and Norway	29,353	11,916
France	7,118	38,528
Spain	2,692	12,180
Other	24,789	49,832
Total	495,434	404,799

Vessels entered (1913), 11,901, of 3,696,330 tons; cleared, 11,937, of 3,628,905. Merchant marine (Jan. 1, 1913), 3547 vessels, of 408,660 tons (507 steamers, of 71,297).

The receipts for 1914 were 167,835,456 marks, ordinary, and 1,268,358 marks, extraordinary revenue, 588,000 marks being taken from the funds; and expenditure 157,021,426 marks, ordinary, and 28,371,641 marks, extraordinary expenditure, 597,160 marks being disposed for the funds. Of the revenue 6,895,024 marks came from direct taxes; 59,098,992 marks from indirect taxes; 79,377,273 marks from the railways, forests, domains, and other properties of the state, and 22,464,167 marks, other revenues. The chief items of expenditure are: government, 3,247,543 marks; justice and prisons, 5,654,394 marks; military affairs, 15,166,162 marks;

civil administration, 14,995,353 marks; religion and education, 19,463,028 marks; communications, 52,497,687 marks; public debt, 8,023,957 marks; commerce and industries, 7,844,128 marks; agriculture, 7,584,604 marks; pensions and grants, 5,622,318 marks, etc.

**GOVERNMENT.** The Russian sovereign is the grand duke. There is a resident governor-general, and a secretary of state residing at Petrograd. The Diet is composed of 200 members elected for three years by universal suffrage.

**FINLAY, SIR ROBERT BANNATYNE.** See GREAT BRITAIN, *Government.*

**FINNEY, FREDERICK NORTON.** An American railroad engineer and president, died in San Francisco, March 18, 1916. He was born in Boston in 1832. After an education at Oberlin College and several years of law practice, he was connected as an engineer with various railroads of the Middle West from 1860 to 1870. In the latter year, as chief engineer and general superintendent, he began the construction of the Canada Southern (now Michigan Central) Railway, which took four years. From 1893 Mr. Finney was largely identified with the building and control of the Missouri, Kansas, and Texas, first as superintendent of construction till 1902, and as president from 1904 till 1906. In 1902-04, while president of the Missouri, Kansas, and Oklahoma, and of the Texas and Oklahoma, he built 389 miles of road which opened up Oklahoma and Indian Territory. He wrote: *Three Months in Italy* (1893); *A Souvenir of the Nile* (1896); *Letters from Across the Sea* (1909).

**FIRE INSURANCE.** See INSURANCE.

**FIRE PROTECTION.** In the larger cities of the United States, particularly in the North, in 1916 greater efforts than ever were being made toward fire prevention as distinguished from fire fighting, and the results of the work of several years previous were being manifested. In 1915 the cities of New York, Chicago, Boston, Cincinnati, and Milwaukee, where fire prevention work had been more or less well organized, all showed substantial reductions in the number of fires or in the losses involved over 1914, while in 1916 for these and other cities the good results continued, the largest fires being distinctly due to abnormal conditions produced by the war and not due to bad municipal housekeeping, though whether these were due to incendiary efforts, carelessness, or hazards inseparable from such industry and traffic, could not be always determined. There were general improvements in fire fighting equipment, such as increased motorization of apparatus and high pressure mains, but the most encouraging feature was the organization of fire prevention work carried out by fire officials and improved building regulations.

**AMERICAN FIRE LOSSES IN 1916.** The fire losses in the United States and Canada during 1916, as recorded by *The Journal of Commerce and Commercial Bulletin* (New York), aggregated \$231,442,995. This amount was above the annual average and was nearly \$50,000,000 ahead of 1915, when the losses reached a total of \$182,836,200. The losses for 1916 were only exceeded six times in the history of the country, and were largely contributed to by heavy losses in the South and in Canada, in addition to which the Black Tom Island explosion and fire

in New York harbor accounted for \$11,000,000 of the total. The total fire losses undoubtedly were increased in amount by the higher values of all classes of commodities.

Aside from the Black Tom Island disaster, the three fires which partook of the nature of general conflagrations, were all in the South. These were at Paris, Texas, causing a loss of \$7,000,000; at Augusta, Ga., causing a loss of \$5,000,000; and at Nashville, Tenn., causing a loss of \$1,500,000. The Canadian losses were heavy, mainly due to several large individual figures, including the Canadian Parliament building at Ottawa, with a loss of \$3,000,000, and the oatmeal mill at Peterboro, with a loss of \$1,500,000.

There were numerous losses in fires in plants devoted to the manufacture of war munitions or where such supplies were collected for shipment. Such fires included the Black Tom Island disaster, the Tennessee Copper Company's plant at Copper Hill, Tenn., and the munitions dock and steamers at Brooklyn.

The movement for national fire protection continued to make progress in 1916, notwithstanding the heavy losses, and where legislation was enacted it was along the lines of stimulating greater public interest in regulations and laws that would prevent fires.

In the year 1916 there were 49 fires which resulted in an estimated property damage of \$500,000 or over. These were as follows:

Location—Description	Estimated damage
Cincinnati, Ohio, railroad depot and express building	\$800,000
Youngstown, Ohio, business buildings	800,000
Ottumwa, Iowa, department store and other	500,000
Holly Springs, Miss., cotton compress	500,000
Ottawa, Ont., Parliament buildings	3,000,000
Fall River, Mass., department store and other	2,000,000
Kingsport, Tenn., chemical works	500,000
Quebec, Que., church	500,000
Pittsburgh, Pa., storage warehouse	500,000
Brooklyn, N. Y., dock, steamers, and lighters	2,000,000
Peoria, Ill., grain elevator	1,000,000
Brunswick, Ga., naval stores plant and yard	750,000
Buffalo, N. Y., fertilizer factory	550,000
St. John, N. B., steamer and cargo	600,000
St. Louis, Mo., glass works	500,000
Copper Hill, Tenn., munition plant	500,000
Nashville, Tenn., residence section	1,500,000
Augusta, Ga., several business blocks	5,000,000
Paris, Tex., general conflagration	7,000,000
Tulsa, Okla., oil field property	1,500,000
New Haven, Conn., railroad shops and yard	700,000
Houston, Tex., cotton and railroad shops	500,000
Bayonne, N. J., oil storage plant and piers	500,000
Decatur, Ala., cotton compress	1,000,000
Medicine Hat, Alberta, flour mill	500,000
Chicago, Ill., chair mfg. plant	500,000
Sandusky, Ohio, several business houses	500,000
Vancouver, B. C., wholesale fish market	600,000
San Francisco, Cal., pier and freight	750,000
Baltimore, Md., grain elevator	1,250,000
Stevens Pottery, Ga., pipe and clay works	500,000
Cleveland, Okla., five oil tanks	500,000
Seattle, Wash., steamship piers	500,000
New York City, storage warehouse	1,000,000
Jersey City, N. J., railroad terminal warehouses and steamers	11,000,000
Vallejo, Cal., flour warehouse	500,000
Merrill, Wis., tannery	500,000
Phoenix, N. Y., business section of town	684,000
Milwaukee, Wis., malt plant and elevator	500,000
Butler, Pa., steel car works	500,000
Oroville, Cal., lumber plant	500,000
St. Paul, Minn., lumber storage yard	512,000
Ithaca, N. Y., salt works	500,000
Chicago, Ill., freight yards and warehouses	500,000
Peterboro, Ont., oatmeal factory	1,500,000
Los Angeles, Cal., iron works	500,000
Fremont, Neb., grain elevator	500,000
Toronto, Ont., car barns and repair shop	500,000
Augusta, Ga., hotel	600,000

The aggregate fire waste of the United States and Canada during the 40 years from 1877 to 1916, inclusive, reached the enormous total of \$6,281,260,220, showing an annual average property destruction of \$157,031,505.

FIRE LOSSES DURING FORTY YEARS, 1877-1916

1916	\$231,442,995	1896	\$115,655,500
1915	182,886,200	1895	129,835,700
1914	285,591,850	1894	128,246,400
1913	224,728,850	1893	156,445,875
1912	225,320,900	1892	151,516,000
1911	284,337,250	1891	143,764,000
1910	284,470,650	1890	108,893,700
1909	203,649,200	1889	128,046,800
1908	238,562,250	1888	110,885,600
1907	215,671,250	1887	120,283,000
1906	459,710,000	1886	104,924,700
1905	175,193,800	1885	102,818,700
1904	252,554,050	1884	110,008,600
1903	156,195,700	1883	110,149,000
1902	149,260,850	1882	84,505,000
1901	164,347,450	1881	81,280,000
1900	163,362,250	1880	74,643,400
1899	136,773,200	1879	77,703,700
1898	119,650,500	1878	64,815,800
1897	110,319,650	1877	68,265,800

Total for forty years ..... \$6,281,260,220

**BLACK TOM ISLAND EXPLOSION AND FIRE.** As the most disastrous American fire of 1916 the explosion which occurred early on the morning of July 30th on Black Tom Island, New York Harbor, is worthy of record. The property loss involved was in excess of \$11,000,000, seven lives were lost, a number of persons were injured, and considerable dislocation of harbor facilities, particularly in the trans-shipment of war supplies, ensued. The fire was said to have started among some freight cars at the end of one of the piers of the National Dock and Storage Co., at Black Tom Island, and spread to a lighter tied up to one of the Lehigh Valley Railroad piers. This lighter was laden with high power explosives and munitions and soon exploded, scattering the fire to the adjoining piers. Cars filled with munitions were on adjoining tracks and these also exploded. Thirteen brick storage warehouses out of the 24 owned and operated by the National Storage Co. were destroyed as well as six piers owned by the storage company and leased to the Lehigh Valley Railroad. Several other brick warehouses were badly damaged, and minor damage was done to the Lehigh Valley grain elevator. Eighty-five loaded cars were destroyed and some 40,000 tons of raw sugar, valued at approximately \$3,400,000, were lost. The railroad officials claimed that the fire started in the barge tied up alongside its pier without authority.

**BOSTON HIGH PRESSURE SYSTEM.** During the year substantial changes in the design of the new high pressure fire service for Boston, Mass., that had been under consideration for several years, were recommended by Joseph Rourke, engineer in charge of the work. A smaller pumping station than was originally planned and the increased use of portable units were recommended, but the suggestions did not meet with the approval of insurance underwriters, who, it was believed, would refuse to remove the advance on rates made after the San Francisco fire. A reduction had been promised in the event of the construction of a system of high pressure mains and a pumping station of 24,000 gallons per minute capacity. In place

of this a small station with a capacity of 6500 gallons per minute at 250 pound pressure, located on the Charles River embankment, was recommended. Furthermore, it was proposed to use gas-driven instead of electrical centrifugal pumps, and with the money saved install a grid-iron pipe system of 11.5 miles with hydrant connection and service, instead of 6.5 miles for the present system which could be provided with the available appropriation. While the proposal was in the interest of economy it was not in line with modern fire practice, which aims to secure adequate pumping capacity at central stations and eliminate so far as possible all portable units. Indeed, Boston was the first American city to contemplate reducing the capacity of pumping stations, once their need had been determined.

**DWELLING HOUSE CONSTRUCTION.** An important publication of the year was *Dwelling Houses*, a code of suggestions for construction and fire protection recommended by the National Board of Fire Underwriters to safeguard homes and lives against the ravages of fire, and published by that body from whom copies may be obtained. This excellent manual, prepared by Ira H. Woolson, Consulting Engineer to the National Board, was intended for the owners of buildings and the carpenters and builders erecting them and was intensely practical, summarizing the best possible and safest construction. This book contains, in simple language, a discussion of all the structural features neces-

sary to make a dwelling reasonably fireproof and safe. It also includes a summary of general precautions for fire protection, all of which should be studied and observed.

**SCHOOL HOUSE CONSTRUCTION.** Serious fires in school houses led to the appointment of a Committee on School House Standardization by the National Educational Association, to frame standard plans for school building construction especially designed to reduce the fire risk. The chairman of the committee was Frank Irving Cooper, architect, of Boston, and the committee began its work by studying the standards already adopted for school building construction.

**STATISTICS OF FIRES.** The National Board of Fire Underwriters through its Committee on Statistics and Origin of Fires, during the year published its usual tables for the leading American and European cities, from which the accompanying information has been compiled. It is, of course, obvious that the great war in Europe prevented any complete summary in this field and that fire destruction due to military activity does not appear. In 1915 there were 25 American cities where the per capita fire loss exceeded \$5, Newport News, Va., heading the list with a per capita loss of \$28. That this is due to bad conditions of fire protection and prevention is shown by the fact that certain cities show large per capita losses for two or more years, and not as the result of a single large fire or conflagration.

STATISTICS OF FIRES IN AMERICAN CITIES, 1915

	Area Sq. Miles	Population	No. of Alarms	No. of Fires	Confined to Building or Place of Origin	Total Loss	No. of Fires per 1000 Pop.	Loss per Capita
New York	814.75	5,742,999	14,867	13,422	13,173	\$5,757,018	2.34	\$1.00
Chicago	194.4	2,455,000	13,634	11,209	11,098	5,111,984	4.57	2.08
Philadelphia	129.5	1,680,000	5,034	4,257	4,129	1,981,873	2.53	1.18
St. Louis	61.37	800,000	4,515	2,678	2,467	1,432,061	3.35	1.79
Boston	47.34	745,439	5,532	4,027	4,006	3,004,509	5.40	4.03
Cleveland	52.72	670,000	2,788	2,654	2,654	991,931	3.96	1.48
Baltimore	33.67	600,000	2,062	1,983	1,971	604,717	3.31	1.01
Pittsburgh	40.67	570,000	2,001	1,883	1,848	482,168	3.30	.85
Detroit	41.75	600,000	3,705	3,212	3,128	1,386,394	5.35	2.31
Buffalo	42.	454,630	1,855	1,783	1,778	769,883	3.92	1.67
San Francisco	38.87	460,000	3,141	2,620	2,548	.....	5.70	.....
Cincinnati	70.8	408,440	1,798	1,708	1,705	365,570	4.18	.90
Newark, N. J.	28.5	366,721	1,313	1,126	1,049	1,131,117	3.07	3.08
New Orleans	196.25	365,000	850	850	804	474,648	2.33	1.30
Washington, D. C.	70.	358,000	1,395	1,281	1,233	859,810	3.68	1.01
Los Angeles	284.	500,000	2,720	2,476	2,365	1,156,190	4.95	2.31

COMPARATIVE FIRE LOSSES

	Number of Cities Reporting Loss					Population		Per Capita Loss				
	1912	1913	1914	1915	1915	1913	1914	1915	1912	1913	1914	1915
United States	800	298	298	333	32,326,633	33,231,804	40,213,230	35,161,266	2.55	2.25	2.32	1.94
Argentina	1	1	..	..	1,428,042	1,428,042	.....	.....	3.58	4.21	..	..
Austria	4	4	1	..	2,658,078	2,734,936	157,000	.....	.30	.25	.42	..
Belgium	1	1	..	..	166,445	168,812	.....	.....	.69	1.86	..	..
Canada	5	6	6	3	957,372	612,453	597,709	249,344	2.88	2.46	3.58	2.79
Chile	..	1	..	1	200,000	200,000	.....	.....	..	.30	..	.58
England	12	14	9	8	7,164,849	7,396,664	6,916,651	6,442,239	.54	.33	.67	1.03
France	6	5	3	3	4,425,696	3,945,743	3,859,224	3,957,729	.84	.49	.63	1.02
Germany	9	8	4	2	2,659,575	2,559,608	836,007	423,673	.20	.28	.17	.49
Hawaii	..	1	..	..	45,000	45,000	.....	.....	..	.69	..	..
Ireland	2	2	2	2	699,808	701,400	700,000	701,500	.57	.28	.39	.55
Italy	3	5	5	3	282,082	1,161,465	1,189,458	1,078,691	.90	.25	.87	.63
Japan	..	3	10	..	..	2,481,528	5,611,983	.....	..	.59	.44	..
Norway	1	1	1	..	250,000	250,400	251,000	253,000	.69	.32	.48	.72
Philippine Islands	..	1	1	1	..	234,409	234,409	234,409	..	4.41	1.28	1.00
Russia	2	2	1	1	3,485,588	3,710,000	1,617,157	2,000,000	.84	.89	1.19	.95
Scotland	2	3	1	3	485,091	1,516,905	163,891	1,584,591	.49	.36	5.35	1.62
South Africa	..	..	1	..	..	..	50,000	.....	..	..	1.77	..
Spain	..	1	1	1	..	605,870	606,150	608,700	..	2.30	.15	3.18
Sweden	1	1	1	..	851,500	383,000	386,211	392,427	.13	.74	.54	.39
Switzerland	1	1	1	..	140,000	142,000	145,000	.....	.04	.15	.19	..
The Netherlands	2	1	1	1	417,693	301,846	312,424	321,653	.12	.11	.07	.14

UNITED STATES		Population	Total Loss	Per Capita
1912—Whole country	.....	95,410,508	*206,438,900	2.16
300 cities	.....	82,826,638	† 82,297,386	2.55
1913—Whole country	.....	97,168,380	*208,768,550	2.10
298 cities	.....	88,281,804	† 74,876,608	2.25
1914—Whole country	.....	98,781,324	*221,439,350	2.24
298 cities	.....	40,213,230	† 93,868,795	2.32
1915—Whole country	.....	100,899,318	*172,033,200	1.71
333 cities	.....	35,161,266	† 68,866,318	1.94

\* Estimated. † Actual figures reported.

SUMMARY OF FIRES IN VARIOUS CITIES OF THE WORLD OUTSIDE OF THE UNITED STATES, 1915

	Area Sq. Miles	Population	No. of Alarms	No. of Fires	Confined to Building or Place of Origin	Total Loss	No. of Fires per 1000 Pop.	Loss per Capita	Loss per Fire
<b>Australia—</b>									
Melbourne	280	670,000	2058	1073	1007	.....	1.60	...	.....
Sydney	.....	800,000	1585	1407	.....	.....	1.76	...	.....
<b>Canada—</b>									
Halifax	.....	48,000	244	244	.....	\$70,512	5.08	1.47	\$289
Hamilton	12.37	101,344	358	144	129	141,562	1.42	1.40	983
St. Johns	4	32,292	60	70	40	.....	2.17	...	.....
Vancouver	16.89	100,000	672	325	221	609,128	2.25	6.09	2707
<b>Chile—</b>									
Valparaiso	.....	220,000	84	26	21	127,000	.12	.58	4885
<b>Denmark—</b>									
Copenhagen	27.18	491,500	792	545	543	.....	1.10	...	.....
<b>England—</b>									
Birkenhead	6.16	142,622	182	172	167	481,700	1.21	3.38	2801
Birmingham	68.12	840,202	1078	895	815	533,440	.99	.68	639
Bolton	28.87	183,879	79	73	73	67,110	.40	.36	919
Cardiff	12.6	182,280	155	151	151	61,770	.88	.34	409
Lancaster	12	41,414	12	12	12	7,215	.29	.17	601
Leeds	41	452,948	286	279	279	282,205	.62	.62	1011
London	117	4,516,612	6167	3595	.....	5,149,940	.60	1.14	1438
York	5.76	82,282	24	21	.....	21,380	.26	.26	1018
<b>France—</b>									
Lyons	.....	560,000	315	290	.....	177,400	.52	.32	612
Marseilles	88.7	550,500	453	446	442	216,712	.81	.39	486
Paris	80.11	2,847,229	4744	4244	.....	3,647,384	1.49	1.28	859
<b>Germany—</b>									
Aachen	68.88	160,808	248	231	.....	39,986	1.44	.25	173
Berlin	24.5	1,973,298	1956	1488	1488	.....	.75	...	.....
Bremen	.....	262,870	296	242	242	204,457	.92	.78	845
Dresden	27.9	578,516	464	352	352	.....	.61	...	.....
Flensburg	17.02	66,506	89	31	31	.....	.46	...	.....
<b>Ireland—</b>									
Belfast	25.8	390,000	245	210	.....	178,030	.54	.46	848
Dublin	12.4	311,500	221	160	160	209,905	.51	.67	1312
<b>Italy—</b>									
Florence	.....	241,120	211	200	.....	53,076	.88	.22	265
Messina	.....	146,969	138	97	97	58,760	.66	.40	608
Milan	.....	690,602	941	738	738	537,735	1.05	.78	729
<b>Norway—</b>									
Christiania	6.3	253,000	333	294	291	182,181	1.16	.72	619
<b>Philippine Islands—</b>									
Manila	14.9	234,409	133	111	91	235,480	.47	1.00	2121
<b>Russia</b>									
Moscow	85.3	2,000,000	1261	1209	898	1,895,684	.60	.95	1568
<b>Scotland—</b>									
Aberdeen	10.5	168,891	176	156	154	41,855	.95	.26	268
Edinburgh	17.8	338,700	599	402	397	177,895	1.19	.53	442
Glasgow	20.27	1,032,000	1840	871	.....	2,265,000	.84	2.19	2600
<b>Spain—</b>									
Madrid	.....	608,700	615	532	314	1,909,060	.87	3.13	3588
<b>Sweden—</b>									
Stockholm	46.37	392,427	330	328	327	113,503	.71	.29	346
<b>The Netherlands—</b>									
The Hague	16.1	321,853	641	305	304	45,929	.95	.14	150

**FISH AND FISHERIES.** The report of the United States Commissioner of Fisheries for the year ending June 30, 1915, appeared in December, 1915, and was the last available at the time of writing this summary. A considerable part of this report dealt with the work of the Bureau of Fisheries in the propagation and distribution of fish, in which substantial improvements have been made over previous years. The total output for the year was 536,260,143 eggs; 3,694,281,699 fry; 58,215,962 fingerlings, yearlings, and adults. Owing to increased efficiency in the work of the various stations, this was done at a lower relative cost than in earlier years. The greater part of these were salmon, trout, and bass, the most important, in the opinion of the commissioner, being the work on the Pacific salmon, of which the number actually liberated increased from 5,764,000 in 1914 to 28,642,000 in 1915. Egg collections and hatching operations were carried on in 32 States and in Alaska, while distribution was made to all of the States, to Porto Rico, Cuba, India, and Japan.

Minor operations of the Bureau of which no definite results were presented, were investigations leading to an increase in the oyster supply, and to attempts at acclimating the lobster on the Pacific coast. Special researches on the food and diseases of fishes, both of the utmost practical importance to the fish culturist, were carried on during the year.

The laboratory at Fairport, Iowa, has been devoting a good deal of time to the study of methods of propagating fresh water mussels, especially with reference to increasing the supply of shells for the button and pearl industries. It was demonstrated that mussels grown in a basket in the river at Fairport grew more than one inch in five and one-half months.

At the Beaufort laboratory, experiments on the rearing of the diamond-back terrapin have been in progress for some years, and it was found in 1915 that animals hatched in 1909 were laying eggs, thus demonstrating that under the conditions of domestication they mature in about six years. Some attention has been given by the Bureau to the question of raising frogs for commercial purposes, the main problem to be solved being the question of procuring a sufficient supply of food for the young frogs.

In spite of the efforts that have been made to increase the number of lobsters, the industry still shows a marked decline in the output, with at the same time an increase in the total value of the catch. Thus, in 1889, the total output was 30,771,573 pounds, valued at \$861,297, while in 1913 the catch was 12,267,017 pounds, valued at \$2,404,822. In 1912 and 1913 Rhode Island showed an increase in the amount of the catch, while Maine and Massachusetts, the chief other lobster producing States, showed a decrease.

For the calendar year 1914, there was landed at Boston, 92,334,192 pounds of fish, having a value of \$2,613,987; and at Gloucester 70,245,028 pounds, with a value of \$1,781,043. Of this, 72.81 per cent of the weight and 68.92 per cent of the value were from fishing grounds lying directly off the coast of the United States; 9.03 per cent of the weight and 9.94 of the value from off the Newfoundland coast; 17.70

per cent of the weight and 20.37 per cent of the value off the Canadian provinces, and only about 1 per cent of both weight and value off the Labrador coast. A detailed statement of the fish landed at these two ports is as follows:

Cod—	Pounds	Value
Fresh .....	36,079,878	\$917,908
Salt .....	11,449,752	441,508
<b>Haddock—</b>		
Fresh .....	57,598,606	1,378,069
Salt .....	155,522	3,087
<b>Hake—</b>		
Fresh .....	12,530,938	238,285
Salt .....	222,083	4,218
<b>Pollock—</b>		
Fresh .....	12,243,546	195,522
Salt .....	211,177	4,214
<b>Cusk—</b>		
Fresh .....	5,747,053	99,547
Salt .....	111,987	3,232
<b>Halibut—</b>		
Fresh .....	3,068,000	246,277
Salt .....	316,585	30,073
<b>Mackerel—</b>		
Fresh .....	3,980,395	196,301
Salt .....	2,708,455	158,424
<b>Herring—</b>		
Fresh .....	4,910,083	118,585
Salt .....	5,838,764	108,628
<b>Swordfish—</b>		
Fresh .....	1,499,844	177,669
<b>Miscellaneous—</b>		
Fresh .....	3,921,657	73,488

The report of a committee appointed to investigate the otter trawl method of fishing, was presented in 1915, and while somewhat inconclusive, indicated that this method is injurious to the fish too small to be of market value, and hence must be used with caution. The output of the mussel fisheries for the year was valued at \$382,210 of shells used in the manufacture of buttons, and \$164,261 worth of pearls found in the shells. The most important streams furnishing this material were Rock River and Illinois River. The appropriations for the conduct of the Bureau for the fiscal year 1915 were \$1,118,471.66. See ALASKA.

The United States government has been experimenting on the isolation of potash from the giant kelp of the California coast, and an unexpected result has been the claim that because of the destruction of the clams, spiny lobsters, and young fish that live in the kelp these experiments injure the fisheries. It appears, however, that the greater number of these animals are below the plane of action of the kelp cutters, which go down only six feet, and no real damage is being done. Recent California legislation allows the catching of catfishes of 7-inch length, and this is reported to be leading to their extermination.

According to G. A. Clark, an expert on the fur seal question, the regulations adopted by the United States government some years ago for the killing of seals are having the expected result in that an excessive number of young males are preserved, so that while there has been an increase of about 25 per cent in the number of the breeding females, since 1912,

the breeding males have increased 150 per cent. This leads to much fighting for the possession of the females, with consequent injury to the young.

It was announced late in the year that an agreement has been reached between the English and Holland governments that 20 per cent of the fish caught by Holland fishermen may go to Germany, 20 per cent to Holland, and the remainder may be sold to neutral countries. At this time the fishing vessels previously held by the English were released. In England, as a result of the interference with channel fishing due to the war, the importance of inshore and shallow water fisheries was emphasized by the fisheries authorities. Of great importance is the development here of the mussel and cockle fisheries. Mussels grow best in water that receives drainage from cultivated land, and that is apt to be contaminated, but it was stated that entirely satisfactory methods for cleansing the mollusks have been devised. See also section *Fisheries* under various countries and various States of the United States, and *ZOOLOGY*.

**FISHER, HERBERT A. L.** See *GREAT BRITAIN, Government*.

**FISKE, STEPHEN.** An American journalist and author, died in New York City April 27, 1916. Born in New Brunswick, N. J., in 1840, and educated at Rutgers College, he was early an editorial writer and correspondent on the New York *Herald*, for which paper he accompanied various foreign notables on tours of the United States. Later he reported news of the Civil War, was dramatic critic of the *Herald*, and accompanied Garibaldi on his last campaign against Rome. Mr. Fiske was subsequently known as a theatrical manager—of the St. James Theatre and Royal English Opera Company in London, and of the Fifth Avenue Theatre, New York. Two famous actresses introduced by him were Mary Anderson and Modjeska. He founded the New York *Dramatic Mirror*, for some time was dramatic editor of *The Field, Illustrated*, and he had written several plays and books, among the latter *Paddy from Cork, and Other Stories*.

**FISK UNIVERSITY.** A co-educational institution for colored students at Nashville, Tenn., founded in 1866. The institution had an enrollment of 558 in all departments in the fall of 1916, and the faculty numbered 53, including administrative officers. Among noteworthy gifts of the year was one of \$10,000 for current expenses, contributed by the General Education Board. The productive funds of the institution amounted, in 1916, to about \$240,500 and the income from all sources to about \$55,500. The library contains 15,000 volumes.

**FJELDEVENTGRET.** See *MUSIC, Opera*.

**FLAGG, CHARLES NOËL.** An American painter and art teacher, died at Hartford, Conn., Nov. 10, 1916. He was born in Brooklyn, N. Y., in 1848, but for most of his life he was identified with Connecticut and Hartford art circles. He studied under Jacquesson de la Chevreuse. In 1888 he founded the Connecticut League of Art Students, which became the Flagg Night School of Drawing for Men; of this he was directing instructor at the time of his death. Mr. Flagg served as first president of the Municipal Art Society of

Hartford, as secretary of the Society of Connecticut Artists, and as president of the Connecticut Academy of Fine Arts. He was also a member of the State capitol commission of sculpture. For the capitol (State library room) and the Supreme Court building in Hartford he did some of his most notable historical paintings. A portrait exhibited by him in 1908 at the National Academy of Design, of which he was elected associate the next year, was awarded the Thomas R. Proctor prize. Mr. Flagg contributed on art subjects to magazines and wrote *The Evolution of an Equestrian Statue* (1909).

**FLAX.** Information regarding the world's flax production in 1916 was very incomplete. Canada, which grows flax practically for seed only, produced about three-fourths of a normal crop. In Great Britain and Ireland, where it is grown for the fibre, the yield of straw was satisfactory and the yield of fibre was better than the year before. British India, which is one of the principal seed-producing countries, devoted 2,763,000 acres to the crop, as compared with 2,612,000 acres the year before. According to a Russian authority, the world's flax area is about 13,230,000 acres, of which Russia furnishes 28.8 per cent, British India 22.9 per cent, Argentina 22.3 per cent, United States 19.3 per cent, Austria-Hungary 1.6 per cent, Canada 1.3 per cent, and other countries 3.9 per cent.

The flaxseed production of the United States in 1916, as estimated by the Department of Agriculture, was 15,459,000 bushels from 1,605,000 acres, the yield per acre being 9.6 bushels. The corresponding figures for 1915 were 14,030,000 bushels, 1,387,000 acres, and 10.1 bushels respectively. The average farm value per bushel on Dec. 1, 1916, was \$2.48, the highest ever recorded, and the total value of the crop was \$38,350,000, also the highest on record. In 1915 the average farm value per bushel on Dec. 1 was \$1.74. In the State of Oregon efforts were continued to establish a flax fibre industry. Commercial and other interests raised a fund of \$6000 to grow 300 acres of fibre flax under the supervision of a Belgian flax expert, and farmers producing under contract flax of certain specified quality were paid a fixed amount per ton from a State appropriation for the purpose. It is estimated that from 3,000,000 to 5,000,000 acres in the Willamette Valley in Oregon and adjoining foothill country are suitable for growing fibre flax.

**FLETCHER, HENRY PRATHER.** An American diplomat, appointed by President Wilson Ambassador to Mexico; the nomination was confirmed by the Senate Feb. 25, 1916. Mr. Fletcher had been connected with the diplomatic service since 1902, as secretary to various legations, as chargé d'affaires for two periods in China, and as Minister to Chile (1910-16). In this last office he had done much to further friendship between the United States and the country to which he was accredited. His appointment to Mexico was considered a mark of great confidence, because of the delicate relations between the two nations. Mr. Fletcher was borne at Green Castle, Pa., in 1873, practiced law after his admission to the bar in 1894, and served in the Philippine Islands during the Spanish-American War.

**FLONZALEY QUARTET.** See **MUSIC, Chamber Music.**

**FLOODS AND FLOOD PREVENTION.** The occurrence of disastrous floods in 1916 again called attention to the fact that in the rapid growth of many American towns and cities located in valleys, adequate thought had not been given to the matter of possible freshets or floods and often the natural channels were encroached on. With many warnings in the past, the menace of flood was being realized in certain districts and studies of rainfall and drainage were being taken up in connection with the engineering problems of construction. Some of the more important projects of 1916 are outlined below.

**SOUTHERN FLOODS.** Much damage was done in the East Gulf and South Atlantic States by destructive floods in July. These floods were caused by two tropical cyclones, the first of which occurred on the night of July 5th-6th, and passed inland through Mississippi, with five days of rain that in some sections was extraordinary in amount. The second cyclonic storm passed inland through South Carolina and was accompanied and followed by unprecedented rains, producing flood conditions in the rivers, carrying away bridges, railways, roads, and buildings. The damage was particularly severe on the Southern, Atlantic Coast Line, and Seaboard Air Line railways. The loss of life resulting from the two storms was placed at 80 persons, for the most part drowned in the streams of North Carolina. The estimated property loss was put at \$21,724,000, divided as follows: Buildings, roads, bridges, culverts, etc., \$4,918,000; crops not gathered, \$11,606,000; live stock and movable farm property, \$811,000; suspension of business, loss of wages, etc., \$1,939,000; railroads in roadbed, bridges, trestles, culverts, etc., \$2,450,000.

**CABIN CREEK FLOOD.** On August 9th, a sudden rising of the water of Cabin Creek, W. Va., due to rainfall of great intensity, flooded a part of West Virginia, and resulted in the loss of some 60 or more lives, the destruction of houses and highways, the washing out of 18 miles of track on the Chesapeake and Ohio Railway, the destruction of electric railway lines, and the sweeping away of nearly every bridge by the torrent. About 400 square miles were affected and damage done that ran into millions of dollars. The flood occurred in broad daylight and thus afforded many a chance to escape, for the valleys in this section are narrow with steep sides.

**FLOODS IN SOUTHERN CALIFORNIA.** On January 16th to 18th Southern California experienced one of the most severe storms in its history, and on January 26th and 27th there occurred a storm of almost equal intensity. Both storms covered all of Southern Califor-

nia and completely demoralized all railway operation. As much as seven inches of rain fell at many places in the two days of the first storm and almost as much in the second storm. The Southern Pacific and the Atchison, Topeka, and Santa Fé railways were the principal sufferers, the line of the latter being out of service a total of 32 days.

**MIAMI VALLEY FLOOD PROTECTION WORK.** The severe and destructive flood of March 23-28, 1913, was the cause of an elaborate engineering investigation of the best possible means to protect the valley of the great Miami River, Ohio, against similar misfortune. A study was made of rainfall and floods experienced by the valley, and plans were made for the most practical control works in view of the greatest possible flood that could be expected. As a result of elaborate studies the engineers reached the conclusion that the best and only practicable method of flood protection for the Miami Valley was a group of retarding basins, and this finding was sustained unanimously late in 1916 by the nine judges of the Miami Conservancy Court, the main point of discussion being on the merits and strength of earth dams, which were the principal feature of the project.

The earliest discussion dealt mainly with the protection of the city of Dayton, but it was found that the entire valley was concerned and the only possible success lay in the coöperation of the communities affected. The earlier plans considered involved the construction of bypasses or cut-offs, widening and deepening the river channel, raising the heights of the levees, diversion of one or more arms of the river and other schemes, for most of which definite cost estimates were made. Finally, after the passage by the Ohio State Legislature of the conservancy law Feb. 17, 1914, and the establishment of the Miami Conservancy District June 24, 1915, an engineering investigation revealed that the most feasible project was to establish large storage reservoirs or retarding basins, as in the flat valley of the Miami and its tributaries there were excellent locations which permitted the construction of dams at reasonable cost and afforded vast storage volume. The plans provided for three basins just above Dayton, one on each of the three main streams that join within the city—the Taylorsville basin on the Miami, the Huffman basin on the Mad River, and the Englewood basin on the Stillwater. On the upper Miami the Lockington reservoir would protect the cities of Piqua and Troy, while on Tivin Creek, a tributary of the Miami below the city, the Germantown retarding basin would reduce the flow where the creek joined the river near Middletown. The accompanying table gives the numerical data for each of these basins.

Basins	Dem		Drainage Area, Sq. M.	Spill-way, Elevation	Water Surface at Spill-way, Acres	Capacity at Spillway Inches of Runoff on Drainage Area		Three-Day Filling with Outlets Discharging
	Height, Ft.	Length, Ft.				Acres	Instantaneous	
Germantown .....	107	1,210	270	815	3,520	106,000	7.30	10.75
Englewood .....	124½	4,660	651	876	7,980	312,000	8.99	10.70
Lockington .....	78	6,400	255	988	4,020	70,000	6.68	10.00
Taylorville .....	78	2,980	1,183	818	11,000	186,000	4.42	9.51
Huffman .....	73	3,340	671	835	9,180	167,000	4.66	9.52
					35,650	841,000		



The dams are each pierced by two to four conduits, permanently open and located at the base of the dam which normally pass the river flow, and under flood conditions discharge water under head. It is assumed in the plans that at the ultimate maximum flood the basins would fill approximately to spillway level, the spillways being provided at from 15 feet to 19 feet freeboard below the dam crest as a safety margin; for with a flood twice as great as that of 1913 the dams would have a freeboard of 5 feet. The conduits would be able to take care of a vast discharge when the basins were full to the spillway.

The cost of the main items of the Miami work is indicated below:

Retarding basins, not including real estate . .	\$6,735,000
Real estate in retarding basins . . . . .	3,500,000
Channel work and local protection . . . . .	3,468,000
Real estate other than in basins . . . . .	2,200,000
Public utilities, relocations, and damages . . .	2,307,000
<b>Total, not including interest, taxes, administration, and contingencies . . . . .</b>	<b>\$18,210,000</b>

The details of the project were fully outlined in the issues of *Engineering News* for the year and particularly in the numbers for Jan. 4 and 11, 1917.

**SCIOTO RIVER SCHEME.** A somewhat similar plan for the protection of Columbus, Ohio, by the control of the Scioto River valley was developed and at the end of the year was about ready to be submitted to a similar judicial inquiry. The temporary impounding of flood water in reservoirs ordinarily dry was thought to be a method of diminishing danger that was capable of much wider application.

**ERIE, PA.** To prevent any such disaster as occurred on Aug. 3, 1915, when the city of Erie was inundated by flood water in Mill Creek, resulting in the loss of 34 lives and \$2,000,000 damage to property (see *YEAR BOOK, 1915*), a \$1,000,000 project was put under way during 1916. Several methods were presented by consulting engineers, including a permanent storage reservoir, a detention reservoir, and a large conduit through the centre of the city. The last was adopted and involved more than two miles of a horseshoe-shaped reinforced-concrete conduit, 22 x 18 feet inside dimensions, located for most of this distance in the heart of the city. This new conduit follows a course where the buildings had been destroyed and removed by the flood. Placing the creek entirely underground would add 12 acres of valuable city property, formerly occupied by the creek bed and channel, to the taxable property of the city. At the same time it was decided to control the flood danger of Ganisoris Run and remove various grade crossings.

**MEMPHIS FLOOD PROTECTION.** During 1916 the city of Memphis, Tenn., had virtually completed a system of flood protection for the low lying portion of the city involving the construction of a levee with concrete core wall and a pumping station to lift the water draining from the territory back of the levee at times of flood. Much of the city is at higher elevations and in order to intercept and discharge to the river the water that otherwise would flow to the pumping station there were constructed two sewers or tunnels, one with a maximum diameter of 16 feet, the other with a maximum diameter of 15 feet. The new im-

provement guards against any flood up to the 50-foot stage of the river which had never risen higher than stage 46½. The levee is 6000 feet long, with a minimum top width of 40 feet and side slopes of 3 on 1. The crest was placed at level 52.5 feet. The main pumping plant has a capacity of 1200 cubic feet per second, while the low level pumping plant operated when the river is at or above stage 34, is of 160 cubic feet capacity. The main pumps are 72-inch centrifugal pumps electrically driven. This interesting plant was described in detail in *Engineering News*, May 11, 1916.

**FLOOD PREVENTION IN KANSAS.** This was the subject of a report by an engineering committee appointed by the Kansas Flood Congress which met in 1915. The report published in 1916 stated that on a conservative estimate the net losses in Kansas during the previous 13 years would amount approximately to \$52,000,000, or an average of \$4,000,000 annually. In addition to the direct monetary losses, there was involved also much indirect property loss and the sacrifice of more than 100 lives. The cost of flood protection must be paid, to a large extent, at least, by taxation upon the citizens of Kansas, though coöperation of the Federal government was necessary, however, for the complete solution of the problem, as many of the streams which cause damage in Kansas have part of their drainage area outside the State. It was also announced that a survey was to be made by the United States Engineers of the Kansas, Neosho, and Cottonwood rivers and their tributaries, with a view to the development of some system of flood control.

**MISSOURI FLOOD CONTROL.** In 1916 active work was in progress to reclaim nearly 1000 square miles of lowland in southwestern Missouri back from the Mississippi River and forming the Little River drainage district. The project involved an outlay of \$4,000,000, and the work included river diversion to a well defined channel to prevent the flood waters spreading over the district and the construction of large detention basins to equalize the flow. At the same time the surface water and rainfall were to be taken care of by an elaborate system of ditches aggregating some 600 miles in length which would serve to reclaim a large area of swamp.

**FLOOD LIGHTING.** See **ELECTRIC LIGHTING.**

**FLORIDA. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 904,839. The population in 1910 was 752,619.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture in 1915-16, were as follows:

	1916	Acreage	Prod. Bu.	Value
Corn . . . . .	1916	840,000	12,600,000	\$11,840,000
	1915	800,000	12,000,000	8,780,000
Oats . . . . .	1916	60,000	900,000	689,000
	1915	61,000	1,220,000	854,000
Rice . . . . .	1916	700	18,000	14,000
	1915	500	12,000	9,000
Potatoes . . . . .	1916	15,000	1,110,000	2,220,000
	1915	12,000	960,000	1,104,000
Hay . . . . .	1916	58,000	70,000	1,120,000
	1915	51,000	a 61,000	976,000
Tobacco . . . . .	1916	2,500	3,025,000	908,000
	1915	3,900	b 3,549,000	816,000
Cotton . . . . .	1916	197,000	48,000	6,412,000
	1915	193,000	48,000	3,409,000

a Tons. b Pounds. c Bales.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments . . . .	2,150	2,518
Average number of wage earners . . . . .	57,473	55,608
Capital invested . . . . .	\$65,291,000	\$88,319,000
Wages . . . . .	22,982,000	24,822,000
The value of materials used . . . . .	26,128,000	38,816,000
The value of products . . . . .	72,890,000	81,112,000

**MINERAL PRODUCTION.** The only mineral production of the State is phosphate rock. During 1915 this industry was in poor condition. Shortly after the outbreak of the war in Europe the phosphate mining companies curtailed their production very materially, or suspended mining altogether. The production in 1915 was 1,358,611 long tons, valued at \$3,762,239. This constituted 74 per cent of the entire production of the United States.

**TRANSPORTATION.** The total mileage of all tracks of the State on June 30, 1916, was 6060. Of this 5040 were single track. There were constructed during the year 115 miles of single track, and 47 miles of other track. The Florida East Coast Railway completed during the latter part of the year the construction of a line from Maytown to New Smyrna, a distance of seven miles. The Atlantic Coast Line began the construction of a line from the line south of Sebring, the objectives being some place on Lake Okeechobee and to Immokalee. The South Florida and Gulf Railway during the year was constructing a line from Keenansville to Fort Bassinger. About 23 miles of this had been completed.

**EDUCATION.** The school population of the State in 1915 was 275,310. There were enrolled in the public schools 177,154, with an average daily attendance of 126,565. There were 3208 female teachers, and 1074 male teachers. The average monthly salary of white male teachers was \$54.02, and of white female teachers \$36.44. The average monthly salary of negro male teachers was \$38.91, and of female teachers \$30.74. The total expenditures for schools during 1914-15 was \$2,769,335.

**FINANCE.** The latest report available for the financial condition of the State is for the fiscal year ending June 1, 1914. The receipts for the year amounted to \$3,429,784, and the disbursements to \$3,390,685, leaving a balance on hand Dec. 31, 1914, of \$1,522,769, which includes a balance at the beginning of the year of \$1,483,699. The public debt amounted to about \$600,000.

**CHARITIES AND CORRECTIONS.** The charitable institutions included the Florida Hospital for the Insane at Chattahoochee, and School for the Deaf and Blind at St. Augustine. The correctional institutions include the Florida Industrial School for Boys at Marianna and State Prison Farm at Raiford. An Industrial School for Girls has been provided for, and will be in operation during 1916.

Through the efforts of the Children's Home Society of Florida a bill was passed by the Legislature of 1915 providing for a commission to investigate and report on the matter of a law to pension indigent mothers by the State.

This commission was organized and the work was done during the year. At the next session of the Legislature the commission will recommend the enactment of such a law.

**POLITICS AND GOVERNMENT.** There were no unusual incidents in the political history of the State in 1916. The State always votes Democratic and the Democratic candidates for State and national officers were all elected. In addition to the Democratic ticket the Republican, Prohibition, and Socialist parties each had candidates for offices. For the first time a new Democratic primary law was put into effect. This resulted in some complications in the election for Governor. Sidney J. Catts was first declared the Democratic nominee in the primaries. W. V. Knott contested the result of the primaries, went into the courts and secured recounts of the vote in several counties, where it was found that a number of second choice votes had not been properly tabulated. These recounts gave the nomination to Knott, and the State canvassing board met and again declared Knott a nominee. In the meantime the Prohibition party nominated Sidney J. Catts for Governor. Mr. Catts neither accepted nor rejected the nomination, but circulated petitions in the several counties of the State, and had his name placed on the general election ballots as an independent candidate for Governor. While Mr. Knott was contesting the case in the courts, Mr. Catts was making thorough canvasses of the State. The campaign was hotly contested. In the election of November 7th Mr. Catts was elected Governor by a vote of 39,556, on the Prohibition Independent ticket. W. V. Knott, Democrat, received 30,343 votes. George W. Allen, Republican, received 10,333. In the vote for President the highest Democratic elector received 55,984 votes, and the highest Republican 14,611. Park Tremell, former Governor of the State, was elected United States Senator, defeating W. R. O'Neal, Republican, and R. L. Goodwin, Socialist. Three constitutional amendments were voted on, only one of which was adopted. This amendment exempted from taxation \$500 worth of property belonging to widows who have families dependent on them for support, and to men who have been maimed, either in battle or otherwise. The vote on this amendment was 20,859 for, and 12,641 against. An amendment to reapportion the Legislature, giving each county a Senator and basing the membership of the House of Representatives on population, largely increasing the present size of the Legislature, was defeated by a vote of 10,258 for, to 17,774 against. A "grandfather" clause amendment to the constitution was defeated by a vote of 10,518 for, to 19,688 against.

**STATE OFFICERS.** Governor, Sidney J. Catts; Secretary of State, H. Clay Crawford; Attorney-General, T. F. West; Comptroller, Ernest Amos; State Treasurer, J. C. Luning; Superintendent of Public Instruction, W. N. Sheats.

**JUDICIARY.** Supreme Court: Jefferson B. Browne, R. F. Taylor, James B. Whitfield, Thomas M. Shackelford, and W. H. Ellis.

**STATE LEGISLATURE.** Both Houses are Democratic.

**FLORIDA, UNIVERSITY OF.** A State educational institution at Gainesville, Fla. In 1915-16 the enrollment was 810 and the faculty numbered 65. The productive funds amounted

to \$200,000, and total income to \$135,000. The library contains 25,000 volumes. President, Albert Alexander Murphee.

**FLOTATION PROCESS.** See METALLURGY.

**FLOUR.** See FOOD AND NUTRITION.

**FLY, HOUSE.** See ENTOMOLOGY.

**FOLK-LORE.** See ANTHROPOLOGY.

**FOOD AND NUTRITION. COST OF FOOD.** The trend of food prices was sharply upward in 1916, and for December 1st, *Bradstreet's* recorded for the United States the highest commodity index in its history. This showed an increase of 28 per cent over the high-water mark reached on Dec. 1, 1915. The wholesale price of practically every important foodstuff had advanced, except rice. Flour had risen from \$5.30 to \$8 per barrel, milk from 5.25 to 7.25 cents per quart, bread from 4 to 5 cents per loaf, lard from 9.5 to nearly 17 cents per pound, potatoes from \$2.40 to \$5.25 per barrel, eggs from 38 to 45 cents per dozen, and many other articles in about the same proportion. A slight decrease in the prices of flour, lard, and potatoes, however, was noted during November.

As *Bradstreet's* remarked, "consumers in general were loud in their complaints about the burdens imposed by prices, the like of which has not been experienced since the period of reconstruction following the Civil War." There was much agitation for relief measures, and several bills were introduced into Congress, proposing such remedies as an embargo on exports of foodstuffs, the regulation of cold storage practices, and the extension of parcel post facilities. A country-wide investigation into the causes of the high prices was begun by the Attorney-General and several of the Federal departments, and similar inquiries were instituted by various State and local authorities. "Following reports of an attempted corner of cold storage eggs and an increase in retail prices in many localities to well-nigh prohibitive figures, egg boycotts were again organized in a number of cities. In New York City dealers were compelled by the State Department of Foods and Markets to stamp cold storage eggs as such, thereby preventing their sale as the fresh laid product." So-called "diet squads" were also organized in Chicago and elsewhere, to demonstrate the possibility of supplying adequate food within certain limits of cost, the publicity given these short trials attracting attention beyond their real merits.

The high prices were, however, world-wide, and in many countries there was also the problem of guarding against a scarcity of the food supply. In Canada, an order was issued under the War Measures Act in November, 1916, prohibiting combinations to enhance prices of the necessities of life and also the undue accumulation of supplies as in cold storage. Upon the reorganization of the British cabinet, late in the year, a food controller was appointed and orders issued restricting the prices of milk, requiring the milling of wheat to include a larger percentage of the by-products in the flour, and otherwise conserving the food supply. France had previously enacted a similar wheat-milling law and regulated the prices charged for cereals and their products, as well as restricted the killing of live stock. Steps were also taken in Spain to modernize the milling of wheat, with a view to increasing the flour production.

In Germany, where the husbanding of the

food supply had already been systematically enforced, many additional stringent regulations were adopted. A maximum price and other limitations were put on the fruit supply. Distribution cards were issued for eggs, and restrictions ordered on the use of milk, herring, potatoes, sugar, and other articles not previously regulated. In Sweden, Norway, and Greece, arrangements for the government to control food supplies and prices were being perfected. See PRICES.

**NUTRITION STUDIES.** The Secretary of Agriculture reported data covering the past 16 years which showed that, although the population of the United States had increased about 33 per cent, the per capita production of the principal food articles, except meats and dairy products, had remained approximately the same or increased. Even for meats there had been an increase since 1913.

Data collected as to the annual value of the food consumed in representative farm families showed an average of \$448 per annum, of which 58 per cent was produced on the farm. Animal products made up 58 per cent, groceries 25, vegetables 11, and fruits 6 per cent of the diet.

Studies of the prevention of spoilage and waste were continued, especially of eggs, fish, and fruit by-products. A simple process for drying surplus and cull potatoes was worked out by the Bureau of Chemistry, while in Germany it is estimated that 10,000,000 tons of potatoes were dried, large quantities being used in the "war bread" and other foods.

Holmes and Langworthy, of the Office of Home Economics, found that the "hard palates" of cattle could be utilized in meat loaves and similar dishes and were quite thoroughly digested, and that "bob veal" was as digestible as market veal, readily prepared for the table, and apparently not unwholesome or a cause of digestive disturbances. Milo maize, Kafir corn, and feterita were found to be promising additions to the human dietary, while kaoliang seemed less desirable. In studies elsewhere, rice flour, cottonseed flour, dried yeast, horse-chestnut flour, sugar-beet flour, and durra flour were successfully substituted for a part of the wheat flour in bread-making. A new "war bread" of higher protein content was devised in Germany, consisting of rye or wheat flour, potato flour, yeast, and salt, while a method was discovered for concealing the employment of blood in bread by decolorizing with hydrogen peroxide. The use of ground straw in bread was found to be undesirable, and the danger of using untested materials was emphasized by several cases of poisoning from eating ground narcissus bulbs. The use of the goose-fish, over 10,000,000 of which are discarded annually by fishermen in this country, was recommended by the United States Bureau of Fisheries, and steps were taken to encourage the use of the dog-fish under the name of "gray-fish."

The South Dakota Experiment Station found that although the newer breakfast foods did not differ materially in nutritive value, their retail price varied from 7.2 to 43.9 cents per pound. The Kentucky Station recommended the wrapping of bread at the bakery in porous paper as the best practice. Elsewhere, it was reported that sausage in skins was not a dangerous source of bacteria, if properly cooked, while eggs soft-boiled, coddled, or fried on only one

side, and candy, especially when hand-dipped, were found to be possible carriers of infection.

Some of the most important work of the year dealt with problems of growth and the relation of food to certain diseases. Soy-bean flour was found to be a promising source of protein and fat for small children suffering from gastrointestinal troubles. On the other hand, raw egg white was found to be decidedly indigestible, and it was suggested that the use of raw eggs, egg white, and albumin water in dietotherapy had little scientific basis. Tough, hard foods, meat vegetables, and acid fruits were found to be beneficial to the teeth of children, while a high carbohydrate diet was conducive to decay. At the Ohio Station, no relation was found between the iodine content of foods and the prevalence of goitre.

McCullum *et al.* demonstrated, at the Wisconsin Station, the necessity in growth of two dietary factors of unknown chemical composition, previously referred to collectively as "vitamins," but now called "fat-soluble A" and "water-soluble B," as well as the absence of these factors in many food materials. Elsewhere it was found that the sterilization of meats and grains may remove some substances essential to normal nutrition, especially the nutrition of the nervous system. Further evidence was accumulated that pellagra is a deficiency disease, perhaps caused by the too exclusive use of diets of wheat flour, corn meal, salt meats, and canned goods.

**BOOKS OF THE YEAR.** The following may be mentioned: Helen Kinne and Anna M. Cooley, *Food and Health* (New York, 1916); H. T. Vulté, *Household Chemistry* (Easton, Pa., 1916); H. W. Wiley, *Not by Bread Alone* (New York, 1916); E. H. S. Bailey, *Laboratory Experiments on Food Products* (Philadelphia, 1916); Martha L. Metcalf, *Students' Manual in Household Arts—Food and Cookery* (Indianapolis, 1916).

**FOOD COMMISSIONS.** See PRICES.

**FOOD CONTROL, FOREIGN.** See PRICES.

**FOOT AND MOUTH DISEASE.** See VETERINARY MEDICINE.

**FOOTBALL.** Interest in the game of football as played by the American colleges showed a remarkable increase during the season of 1916. The Yale-Harvard battle in the Yale Bowl at New Haven attracted a throng of 80,000 persons, while the Army-Navy contest at the Polo Grounds, New York City, was witnessed by 50,000. It is estimated that 35,000 football games were played throughout the United States and that the total number of spectators numbered 6,500,000.

The year was full of surprises for the followers of the gridiron game. Elevens which had never before figured in the championship ratings attained their ambition in 1916. Pittsburgh, Colgate, and Brown were the new names added to football's hall of fame. Pittsburgh went through the season without suffering a defeat, but the teams met by the Pennsylvanians were not of the high calibre that Colgate and Brown were forced to contend with. The most notable victories won by Pittsburgh were those over Pennsylvania, Washington and Jefferson, Syracuse, and Penn State.

The one blot on the record of Colgate was the defeat of the New Yorkers by Yale. In this contest, however, some of the star Colgate play-

ers either were unable to take part or were suffering from injuries received in previous games, and not in condition to do themselves justice. Against Brown, which had already defeated Yale and Harvard, Colgate was at its best, and it was the opinion of the experts that at this particular time even Pittsburgh would have been overthrown by Larry Bankart's men.

The year was noteworthy for Yale in that for the first time in six years the Blue defeated Harvard. The touch down scored by Neville which brought victory to the New Haven team was the first made against the Crimson by Yale since Percy D. Haughton became coach at Cambridge. Yale also was victorious over Princeton, its only setback coming from Brown. Harvard succeeded in getting revenge for the defeat at the hands of Cornell in 1915, winning from the Ithacans by a goodly margin.

Ohio State University carried off the honors among the Conference colleges of the Middle West, while on the Pacific Coast the University of Washington and the University of Oregon developed the best teams. Georgia Institute of Technology and the University of Tennessee were the leaders in the South.

Walter Camp made the following selections for his All-America first team:

Ends—Baston, Minnesota, and Moseley, Yale; tackles, West, Colgate, and Horning, Colgate; guards, Black, Yale, and Dadmun, Harvard; centre, Peck, Pittsburgh; quarterback, Anderson, Colgate; halfbacks, Oliphant, West Point, and Pollard, Brown; fullback, Harley, Ohio State.

A summary of the games played by the leading college teams follows:

Pittsburgh 58, Westminster 0; Pittsburgh 20, Navy 19; Pittsburgh 30, Syracuse 0; Pittsburgh 20, Pennsylvania 0; Pittsburgh 46, Allegheny 0; Pittsburgh 37, Washington and Jefferson 0; Pittsburgh 14, Carnegie Institute of Technology 6; Pittsburgh 31, Penn State 0.

Colgate 54, Susquehanna 0; Colgate 28, Maine 0; Colgate 15, Illinois 3; Colgate 33, Rhode Island State 0; Colgate 27, Springfield Y. M. C. A. College 14; Colgate 3, Yale 7; Colgate 35, Rochester 6; Colgate 15, Syracuse 0; Colgate 28, Brown 0.

Brown 18, Rhode Island State 0; Brown 42, Trinity 0; Brown 69, Amherst 0; Brown 20, Williams 0; Brown 21, Rutgers 3; Brown 40, Vermont 0; Brown 21, Yale 6; Brown 21, Harvard 0; Brown 0, Colgate 28.

Army 3, Lebanon Valley 0; Army 14, Washington and Lee 7; Army 17, Holy Cross 0; Army 53, Trinity 0; Army 69, Villanova 7; Army 30, Notre Dame 10; Army 17, Maine 3; Army 17, Springfield Y. M. C. A. College 2; Army 15, Navy 7.

Yale 25, Carnegie Tech. 0; Yale 61, Virginia 3; Yale 12, Lehigh 0; Yale 19, Virginia Tech. 0; Yale 36, Washington and Jefferson 14; Yale 7, Colgate 3; Yale 6, Brown 21; Yale 10, Princeton 0; Yale 6, Harvard 3.

Pennsylvania 3, West Virginia 0; Pennsylvania 27, Franklin and Marshall 0; Pennsylvania 0, Swarthmore 6; Pennsylvania 15, Penn State 0; Pennsylvania 0, Pittsburgh 20; Pennsylvania 19, Lafayette 0; Pennsylvania 7, Dartmouth 7; Pennsylvania 10, Michigan 7; Pennsylvania 16, West Virginia Wesleyan 0; Pennsylvania 23, Cornell 3.

Princeton 21, Holy Cross 0; Princeton 29, North Carolina 0; Princeton 3, Tufts 0; Prince-

ton 33, Lafayette 0; Princeton 7, Dartmouth 3; Princeton 42, Bucknell 0; Princeton 0, Harvard 3; Princeton 0, Yale 10.

Penn State 27, Susquehanna 0; Penn State 55, Westminster 0; Penn State 50, Bucknell 7; Penn State 39, West Virginia Wesleyan 0; Penn State 0, Pennsylvania 15; Penn State 48, Gettysburg 2; Penn State 79, Geneva 0; Penn State 10, Lehigh 7; Penn State 0, Pittsburgh 31.

Washington and Jefferson 87, Bethany 0; Washington and Jefferson 53, Geneva 0; Washington and Jefferson 21, West Virginia Wesleyan 0; Washington and Jefferson 47, Marietta 6; Washington and Jefferson 12, Westminster 0; Washington and Jefferson 14, Yale 36; Washington and Jefferson 0, Pittsburgh 37; Washington and Jefferson 10, Washington and Lee 7; Washington and Jefferson 12, Rutgers 9.

Dartmouth 33, New Hampshire 0; Dartmouth 32, Boston College 0; Dartmouth 47, Lebanon Valley 0; Dartmouth 62, Massachusetts Aggies 0; Dartmouth 0, Georgetown 10; Dartmouth 3, Princeton 7; Dartmouth 15, Syracuse 10; Dartmouth 7, Pennsylvania 7; Dartmouth 7, West Virginia 7.

Harvard 10, Colby 0; Harvard 26, Bates 0; Harvard 3, Tufts 7; Harvard 21, North Carolina 0; Harvard 47, Massachusetts Aggies 0; Harvard 23, Cornell 0; Harvard 51, Virginia 0; Harvard 3, Princeton 0; Harvard 0, Brown 21; Harvard 3, Yale 6.

According to figures compiled by the Associated Press, football caused 15 deaths during 1916, as against a total of 16 in the preceding year. College officials identified with the sport contend that in no instance did death occur in any game in which the players were known to be physically as well as mentally trained for the severe test. The majority of those who lost their lives were members of high school, semi-professional, and independent elevens. Only one of the victims was a college player.

Association football, or soccer, had another successful year, the feature of which was the tour of the All-America team of the United States Football Association through the Scandinavian countries. Six games were played, the Americans winning three, drawing two, and losing one. The results of the contests follow: All-America 1, Stockholm Tigrarna 1; All-America 3, All-Sweden 2; All-America 0, Stockholm A. I. K. and Djurgardens I. F. (combined) 3; All-America 2, Gothenburg, O. I. 1; All-America 1, All-Norway 1; All-America 2, Stockholm A. I. K. and Djurgardens I. F. (combined) 1.

The Bethlehem Steel Co. Football Club captured both the National Challenge Trophy and the American Football Association Cup, defeating the Fall River Rovers in the final match for the first-named prize and the Scottish-Americans for the A. F. A. award. The University of Pennsylvania won the intercollegiate championship.

The usual competitions were held in the United Kingdom, but the attendance was naturally much less than in the years before the war. The proceeds of many of these games went to various war relief funds. The honors in the Football League were won by Manchester City, but the team that stood out most prominently during the year was Chelsea, which won 17 games and lost only two. The Celtics carried off the laurels in the Scottish League.

**FORDHAM UNIVERSITY.** A Roman Catholic educational institution in New York  
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City. It was founded in 1841. The enrollment in the fall of 1916 in the different departments was as follows: College, 365; law, 523; medicine, 287; pharmacy, 122—a total of 1297. In addition, there were 200 students in sociological courses. The university has \$75,000 in productive funds, which last year yielded \$3125. The library contains 72,700 volumes. President, Rev. Joseph A. Mulry, S. J.

**FORD PEACE EXPEDITION.** See UNITED STATES AND THE WAR.

**FOREIGN EXCHANGE.** See FINANCIAL REVIEW.

**FOREIGN TRADE.** See FINANCIAL REVIEW.

**FORESTRY.** The most notable events in the forest world in 1916 was the wholesale destruction of forests for war purposes in the European countries usually dependent on timber imports, and the resultant stimulation to forest protective activities as well as the more economic utilization of forest products in America. Reduced shipping facilities, combined with high freight and handling costs, rendered exports of American timbers practically prohibitive. By virtue of their favorable position with respect to enemy forests the Teutonic allies suffered least from lack of timber. In England and France, on the other hand, many parks and woodlands not originally intended as lumber producers have been cut clean by corps of Canadian lumbermen. Italy also was drawing extensively on her reserve stock of standing timber. Although an active reforestation propaganda has developed in these countries, the present economic condition in relation to lumber is serious, and it is expected that the forests and forest products of America will play an important part in the upbuilding of Europe after the war. Canada has been especially active in seeking these future markets. During the year a Dominion Trade Commission was sent abroad for this purpose. In British Columbia local shipbuilding was subsidized and ships are being constructed primarily for the timber trade of the province. Recent mechanical tests of British Columbia Douglas fir made in England have shown its high superiority over Baltic timber for railway ties. Reports on the forest resources of British Columbia and Saskatchewan were completed and work in connection with a forest survey in New Brunswick was actively under way. The Dominion government has excluded all foreign lumber in connection with the public work. The Canadian Pacific Railway took similar action. The United States government has prepared a report on American woods available for exports, containing information of use to American consuls and foreign purchasers.

**FOREST PROTECTION.** The most serious forest fire in America in 1916 occurred during the late summer in Northern Ontario. Over two hundred persons were killed and many others injured. Several villages and large amounts of timber were also destroyed. Summing up the forest fire situation as a whole, it may be said that the efficiency of organized fire protection in America has been thoroughly demonstrated, and that in recent years disastrous fires, such as the above, have been confined to poorly-protected sections. A strong campaign is under way to reorganize the protective system in Ontario. Although government and private agencies are cooperating more closely there is still room for

improvement. The United States Forest Service estimates that in the calendar year 1915 some 40,000 fires burned over about 6,000,000 acres of forest area in the United States, with a money loss in timber, young tree growth, and improvements of at least \$7,000,000. For the same period, the organized protective system on the National Forests confined 6324 fires to 155,416 acres, with a total loss of only \$353,389. This was accomplished at a cost of only \$212,436. Similar results are being secured in organized cooperative work with States and private agencies. Twenty-one States are now cooperating with the government in protecting watersheds of navigable streams from fire. At present there are 40 fire protective associations among the timber owners, chiefly in the Northwest. The land thus privately protected is estimated at approximately 25,000,000 acres.

**THE NATIONAL FOREST SERVICE.** On June 30, 1916, there were 152 National Forests in the United States, with a total area of 176,088,608 acres, of which 20,668,328 acres is private land. Presidential proclamations and executive orders during the year excluded from the National Forests 8,534,061 acres of land and added 116,916 acres. A very large part of the agricultural lands in the forests have now been eliminated. Only 2589 applications for forest homesteads were received in 1916 as compared with 4433 in 1915. The total receipts from the National Forests during the year ended June 30, 1916, amounted to \$2,823,540.71. Of this amount over \$1,000,000 is returnable to the States in which the forests are situated for county, school, and road purposes (see 1914 YEAR BOOK). In addition to these State allotments a provision of the Federal Aid Road bill, which became a law on July 11th, appropriates \$1,000,000 a year for 10 years for the construction and maintenance of roads and trails within or partly within the National Forests in cooperation with the various States and counties concerned, provided that not more than 10 per cent of the value of the timber and forage resources of the National Forests within these areas may be spent for roads and trails.

On recommendation of the Forest Service, the National Forest Reservation Commission approved for purchase during the year under the act of March 1, 1911, 54,898 acres in the Southern Appalachians and White Mountains. The total approved and being acquired is now 1,329,487 acres, of which 706,974.50 acres have been acquired. On 143,247.67 acres condemnation proceedings are pending. The remainder awaits the completion of survey or title examination. Continuation of the purchase policy was provided for by a new appropriation of \$3,000,000, available for the fiscal years 1917 and 1918. The Sieur de Monts National Monument, which includes more than 5000 acres on Mt. Desert Island, Maine, directly south of Bar Harbor, was created by presidential proclamation on July 8, 1916.

Investigative work on the National Forests followed in the main the same lines as in previous years. In the kiln drying of lumber the most important developments of the year were the discovery of a method of piling which improves circulation, the perfection of a method for southern pine lumber which permits drying in 39 hours from green to shipping weight with a loss of less than 1 per cent, and the per-

fection of a method for red gum, one of the most difficult and refractory woods to dry, which reduces ordinary commercial losses of approximately 15 per cent to less than 1 per cent. These processes have been developed on a semi-commercial scale. The drying of maple shoe lasts, of which a great number are used in the United States, has been difficult because of the size of the blocks from which they are manufactured. On a semi-commercial scale the period required for drying has been reduced to seven weeks from nearly two years, without increased loss. The value of the dyeing principle of the Osage-orange wood has been so conclusively shown that from \$750,000 to \$1,000,000 worth of the dye is now being manufactured annually in the United States, practically all from material which was formerly wasted. Investigations conducted at the laboratory have resulted in the use of spent tanbark in the manufacture of asphalt shingles to the extent of 160 tons per week. A new process has been developed on a semi-commercial scale for the manufacture of kraft or wrapping paper, and the suitability of 13 National Forest species for its manufacture has been shown. In addition to improving the quality and increasing the strength, the process promises reduced costs of at least 10 to 15 per cent and increased yields of at least 5 per cent. A method has been discovered whereby the yields of alcohol and acetate of lime from the destructive distillation of hardwoods have been increased 15 per cent.

**TREE DISEASES.** The State of Pennsylvania has renewed its campaign in the control of chestnut blight, white pine blister rust, and other tree diseases, and J. G. Sanders, formerly Wisconsin State Entomologist, has been placed in charge of this work. Late in the year the United States Department of Agriculture announced a serious outbreak of the European poplar canker in the United States. This disease attacks the twigs, limbs, and trunks of the black and Lombardy poplars (*Populus nigra*) and of the Carolina poplars or cottonwoods (*P. deltoides*), and may be expected to attack other species of poplars and cottonwoods in regions not yet investigated. During the present year the pathologist of the Department found the disease prevalent in small areas in certain districts in the States of New Hampshire, Massachusetts, Rhode Island, Connecticut, New Jersey, Pennsylvania, Delaware, Maryland, Ohio, Nebraska, and New Mexico.

**FOREST SCHOOLS, PERSONNEL, ETC.** The forest academy at Eisenach, founded in 1830 and productive of many noted foresters, has been abolished owing to financial difficulties due to the war. The forest school of the Philippines has been separated from the College of Agriculture and made a distinct school of the University of the Philippines. Arthur F. Fischer has been appointed Acting Chief of the Philippine Forest Service in the absence of W. F. Sherfese, who is now acting as forestry adviser to China and co-director of the Forestry Bureau at Peking. This bureau was inaugurated at the beginning of the year under the Department of Agriculture and Commerce. Dr. Schenck, formerly director of the Biltmore School, is occupying an administrative position in Brussels, Belgium.

The State College of Washington, the New York State College of Forestry at Syracuse, and

the University of Minnesota are offering correspondence courses in lumber and its uses. The University of California commenced a new four-year course in forest or logging engineering. The Oregon Agricultural College has completed a \$40,000 forestry building. The Yale Forest School has instituted research and instruction in tropical forestry. Forest instruction may now be obtained in 52 institutions in the United States, 23 of which give courses leading to a degree in forestry.

The first Southern forestry congress was held at Asheville, N. C., from July 11th to 15th. Many lumbermen, railroad men, and private landowners interested in fire protective organizations were present.

At the annual meeting of the Society of American Foresters, held on January 22nd, in Washington, D. C., Dr. B. E. Fernow was elected president. The society introduced recommendations of the executive committee looking to the amalgamation of the *Proceedings of the Society of American Foresters* and the *Forestry Quarterly*. Mr. Charles Lathrop Pack was re-elected president of the American Forestry Association at its annual meeting in Boston, January 17th. At the annual meeting of the Canadian Forestry Association, Ottawa, January 20th, Lieut.-Col. J. B. Miller was elected president.

From exhibitors at the Panama-Pacific International Exposition, the University of California has received a large amount of demonstration material for forestry, including the very complete collection of Japanese lumber presented by the Japanese government, and representative samples of the principal woods of China, Honduras, and Guatemala. Sweden gave an exhibit showing by-products obtained through distillation of wood. North Carolina has received a gift of a tract of land in the loblolly pine region to be used for experimental and demonstration forests. The Government of British Columbia recently presented the Kew Gardens, London, with a fir flagstaff over 214 feet long, nearly 3 feet in diameter at the base, and 1 foot in diameter at the top.

**NECROLOGY.** Dr. Richard Hess, the well known professor of forestry at the University of Giessen, died on January 18th, aged 81 years.

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tioned: J. F. Pernot, *Forests of Crater Lake National Park*; G. F. Allen, *The Forests of Mount Rainier National Park*; and C. L. Hill, *Forests of Yosemite, Sequoia, and General Grant National Parks*.

**FORMOSA.** An island dependency of Japan, off the coast of the Chinese Province of Fukien. Capital, Dai-Hoku (or Taipei). Area of the Island of Formosa, 2318.5 square ri; of the seven adjacent isles, 5.6 square ri; total, 2324.1 square ri (13,841 square miles). Estimated population at the end of 1914, 3,812,184; at the end of 1913, 3,543,553, of whom 3,390,452 were indigenes, 133,937 Japanese, and 19,164 foreigners. The population Dec. 31, 1911, of Dai-Hoku (consisting of Jonai, Moko, and Daitote) is stated at 95,077; Dainan (or Tainan), 59,601; Kaga (or Chia-i), 22,418; Rokko (or Lukong), 19,153; Kiilung (or Keelung), 17,962.

The agricultural products include rice (by far the most important) and other cereals, tea, sugar-cane, sweet potatoes, jute, and hemp. The area planted to rice in 1913 is reported at 498,431 cho, yielding 5,126,317 koku, as compared with 485,213 cho and 4,046,611 koku in 1912 (1 cho = 2.45 acres; 1 koku = about 1.804 hectolitres, or 4.963 English bushels). The number of cattle in 1913 was 428,307; goats, 129,094; swine, 1,321,920; horses, 179. An important forest product is camphor, which is worked as a government monopoly. The mineral output in 1913 was valued at 4,015,102 yen, as compared with 4,302,969 in 1912 and 3,066,914 in 1908 (the yen has a par value of 49.846 cents). Output value in 1912 and 1913 respectively, in thousands of yen: gold, 2137 and 1502; coal, 892 and 1222; copper, 1031 and 998; silver, 132 and 63; other minerals, 110 and 230. Fishery produce in 1912 was valued at 992,737 yen and in 1913 at 1,412,118 yen. The manufactures of Formosa include flour, sugar, spirits, tobacco, oil, and soap.

Imports and exports were valued at 52,893,085 and 58,720,430 yen respectively in 1914, as compared with 60,853,709 and 53,378,369 in 1913. Imports from and exports to foreign countries and from and to Japan are reported as follows:

	Imports		Exports	
	Foreign	Japan	Foreign	Japan
1904	12,590,010	10,156,311	12,391,124	10,481,807
1912	19,807,126	48,325,290	14,960,228	47,881,451
1913	18,023,724	42,835,593	12,942,442	40,446,620
1914	18,013,987	39,879,148	12,982,314	45,788,116

In 1914, classified imports and exports (both the foreign and the Japanese trade) included the following, in thousands of yen: rice, other cereals, flour, etc., 3499 and 6184; other food-stuffs, together with beverages and tobacco, 12,136 and 36,616; drugs, dyes, etc., 4484 and 9285; cotton fabrics, yarn, etc., 8049 and 799; minerals, pottery, metal goods, etc., 2454 and 3061.

Revenue and expenditure for the year 1913-14 are reported at 54,217,922 and 44,473,781 yen respectively; the budget for 1914-15 balanced at 48,337,133 yen; for 1915-16, the estimated revenue was 41,746,912 yen, the estimated expenditure 41,702,690 yen. Formosa is administered by a Japanese governor-general.

**FORTIFICATIONS.** See MILITARY PROGRESS.

**FOUNTAIN, DRINKING.** See HYGIENE.

FOURTH OF JULY INJURIES. See TETANUS.

FRANCE. A republic in western Europe, since Sept. 4, 1870; one of the original members of the Triple Entente in the War of the Nations. It is divided into 87 departments, including the Island of Corsica, in the Mediterranean, off the west coast of Italy. Capital, Paris.

AREA AND POPULATION. No later figures for area and population are available than those given in the preceding YEAR BOOK, but they are repeated here for convenience. The area is stated at 53,646,374 hectares, equivalent to 536,464 square kilometers, or 207,129 square miles. The table following gives, by departments, areas in square kilometers, legal population according to the censuses of 1911 and 1906, and density in 1911:

	Sq. km.	1911	1906	Dens.
Ain	5,825.60	342,482	345,856	58.8
Ainno	7,428.85	530,226	534,495	71.4
Allier	7,891.83	406,291	417,961	50.0
Alpes				
(Basses-)	6,988.40	107,281	118,126	15.3
Alpes				
(Hautes-)	5,643.11	105,083	107,498	18.6
Alpes-				
Maritimes..	3,786.26	356,338	334,007	95.4
Ardèche	5,556.07	331,801	347,140	59.7
Ardennes	5,252.59	318,896	317,506	60.7
Ariège	4,908.33	198,725	205,684	40.5
Aube	6,026.29	240,755	243,670	39.9
Aude	6,342.27	300,537	308,327	47.4
Aveyron	8,771.13	369,448	377,299	42.1
Bouches-du-				
Rhône	5,247.95	805,532	765,918	153.5
Calvados	5,692.61	396,318	403,431	69.6
Cantal	5,779.33	223,361	228,690	38.6
Charente	5,971.75	346,424	351,733	58.0
Charente-				
Inférieure.	7,281.51	450,871	453,793	62.3
Cher	7,303.53	337,810	343,484	46.3
Corrèze	5,887.65	309,646	317,480	52.6
Corse	8,721.82	299,320	291,160	33.1
Côte-d'Or	8,786.77	350,044	357,950	39.8
Côtes-du-Nord	7,217.64	605,523	611,506	83.9
Creuse	5,606.13	266,188	274,094	47.5
Dordogne	9,224.20	437,432	447,052	47.4
Doubs	5,260.03	299,935	298,438	56.9
Drôme	6,561.36	290,894	297,280	44.3
Eure	6,037.48	323,651	330,140	53.6
Eure-et-Loir.	5,989.80	272,255	273,823	45.8
Finistère	7,029.47	309,771	795,103	115.2
Gard	5,880.65	413,358	421,166	70.3
Garonne				
(Haute-)	6,366.99	432,126	442,065	67.9
Gers	6,290.58	221,994	231,188	35.3
Gironde	10,725.60	820,095	823,925	77.3
Hérault	6,224.27	480,484	482,779	77.2
Ile-et-Vilaine	6,992.34	609,098	611,805	86.9
Indre	6,906.44	287,673	290,216	41.1
Indre-et-Loir.	6,158.47	341,205	237,916	35.4
Isère	8,236.58	555,911	562,315	67.5
Jura	5,055.25	252,713	257,725	50.0
Landes	9,364.04	288,902	293,397	30.8
Loir-et-Cher.	6,421.86	271,231	276,019	42.2
Loire	4,799.31	640,549	643,934	133.5
Loire				
(Haute-)	5,001.39	303,838	314,770	60.7
Loire-In-				
férieure	6,979.97	669,920	666,748	95.7
Loiret	6,811.88	364,061	364,999	53.4
Lot	5,226.13	205,769	216,611	39.4
Lot-et-				
Garonne	6,384.76	268,083	274,610	49.8
Lozère	5,179.82	122,738	128,016	23.7
Maine-et-				
Loire	7,218.03	508,149	518,490	70.4
Manche	6,411.68	476,119	487,443	74.3
Marne	8,205.31	486,310	484,157	53.2
Marne				
(Haute-)	6,256.95	214,765	221,724	34.3
Mayenne	5,212.23	297,732	305,457	57.1
Meurthe-et-				
Moselle	5,279.56	564,730	517,508	107.0
Meuse	6,240.57	277,955	280,220	44.5
Morbihan	7,092.49	578,400	573,152	81.5
Nièvre	6,388.14	299,312	313,973	48.4
Nord	5,773.73	1,961,780	1,895,861	339.7
Oise	5,886.73	411,028	410,149	69.8
Orne	6,144.10	307,433	315,993	50.0

	Sq. km.	1911	1906	Dens.
Pas-de-Calais.	6,751.56	1,068,155	1,012,466	153.2
Puy-de-Dôme.	8,016.13	525,916	535,419	65.6
Pyénées				
(Basses) ..	7,712.38	443,318	425,817	56.2
Pyénées				
(Hautes-)	4,534.49	206,105	209,397	45.5
Pyénées-				
Orientales.	4,148.50	212,986	213,171	51.4
Belfort (Ter-				
ritoire de).	6,084.90	101,386	95,421	166.6
Rhône	2,859.34	915,581	858,907	322.0
Saône				
(Haute-)	5,375.24	257,606	263,890	47.9
Saône-et-				
Loire	8,627.41	604,446	613,377	70.1
Sarthe	6,244.79	419,370	421,470	67.1
Savoie	6,187.91	247,890	253,297	40.0
Savoie				
(Haute-)	4,598.01	255,187	260,617	55.5
Seine	4,795.00	4,154,042	3,848,618	866.5
Seine-In-				
férieure ..	6,341.99	877,383	863,379	138.4
Seine-et-				
Marne	5,931.07	363,561	361,939	61.3
Seine-et-				
Oise	5,658.94	317,617	749,753	144.5
Sèvres				
(Deux-)	6,054.34	337,627	339,466	55.8
Somme	6,277.12	520,161	532,567	82.9
Tarn	5,780.44	324,090	330,533	56.1
Tarn-et-				
Garonne	3,730.56	182,537	188,553	49.9
Var	6,023.89	330,755	324,638	54.9
Vaucluse	3,578.46	238,656	239,178	66.7
Vendée	7,015.53	438,520	442,777	62.5
Vienne	7,044.14	332,276	333,621	47.2
Vienne				
(Haute-)	5,555.23	384,736	385,732	69.2
Vosges	5,903.03	433,914	429,812	73.5
Yonne	7,460.64	308,889	315,199	40.7
Totals	536,468.74	39,601,509	39,252,245	73.8

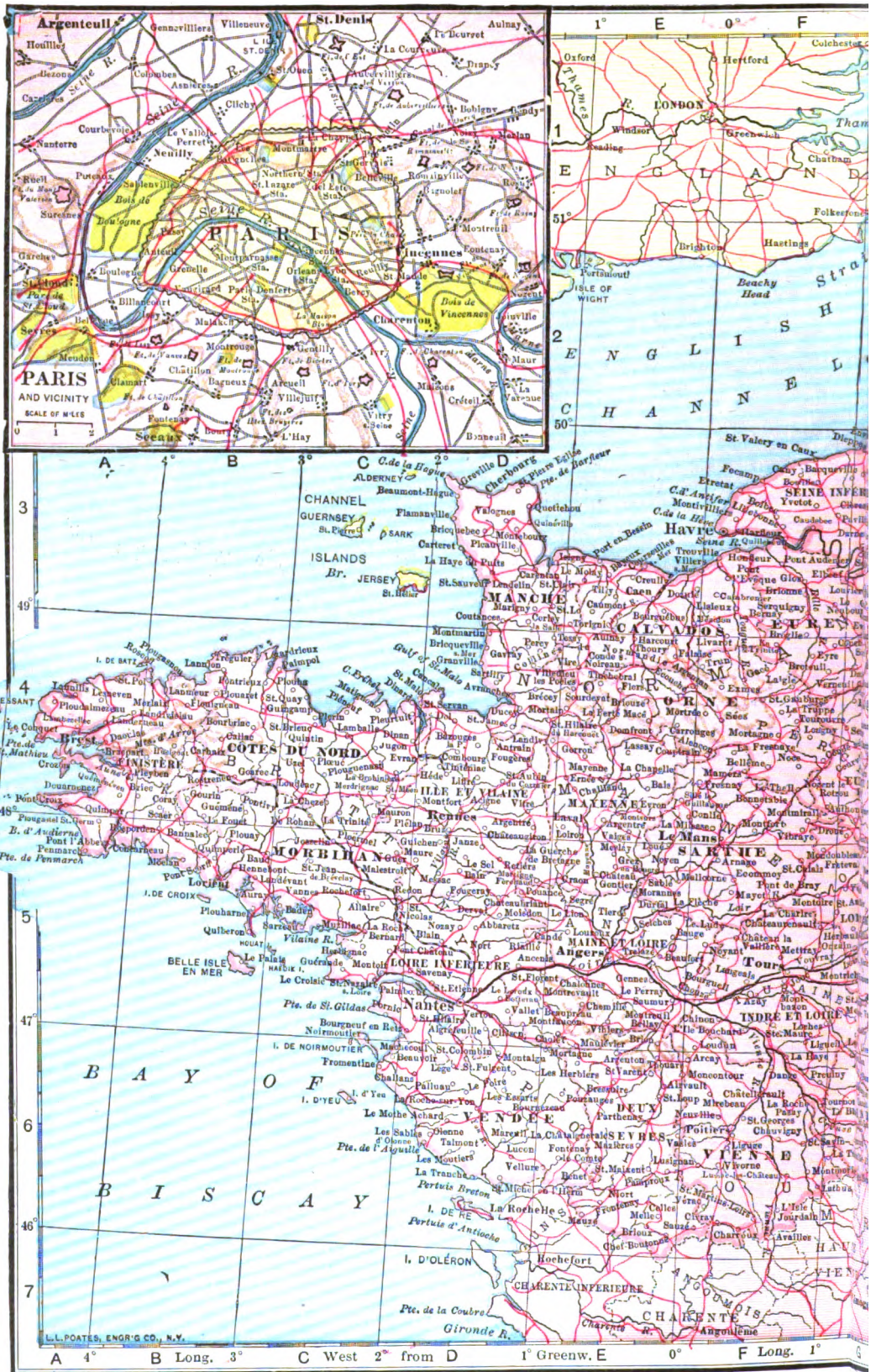
Marriages in 1913 numbered 298,760 (311,929 in 1912), and 169,011 in 1914; births, 779,658 (784,963), and 594,222; deaths, 737,757 (727,052), and 647,549. In the death figures for 1914 war victims are not included.

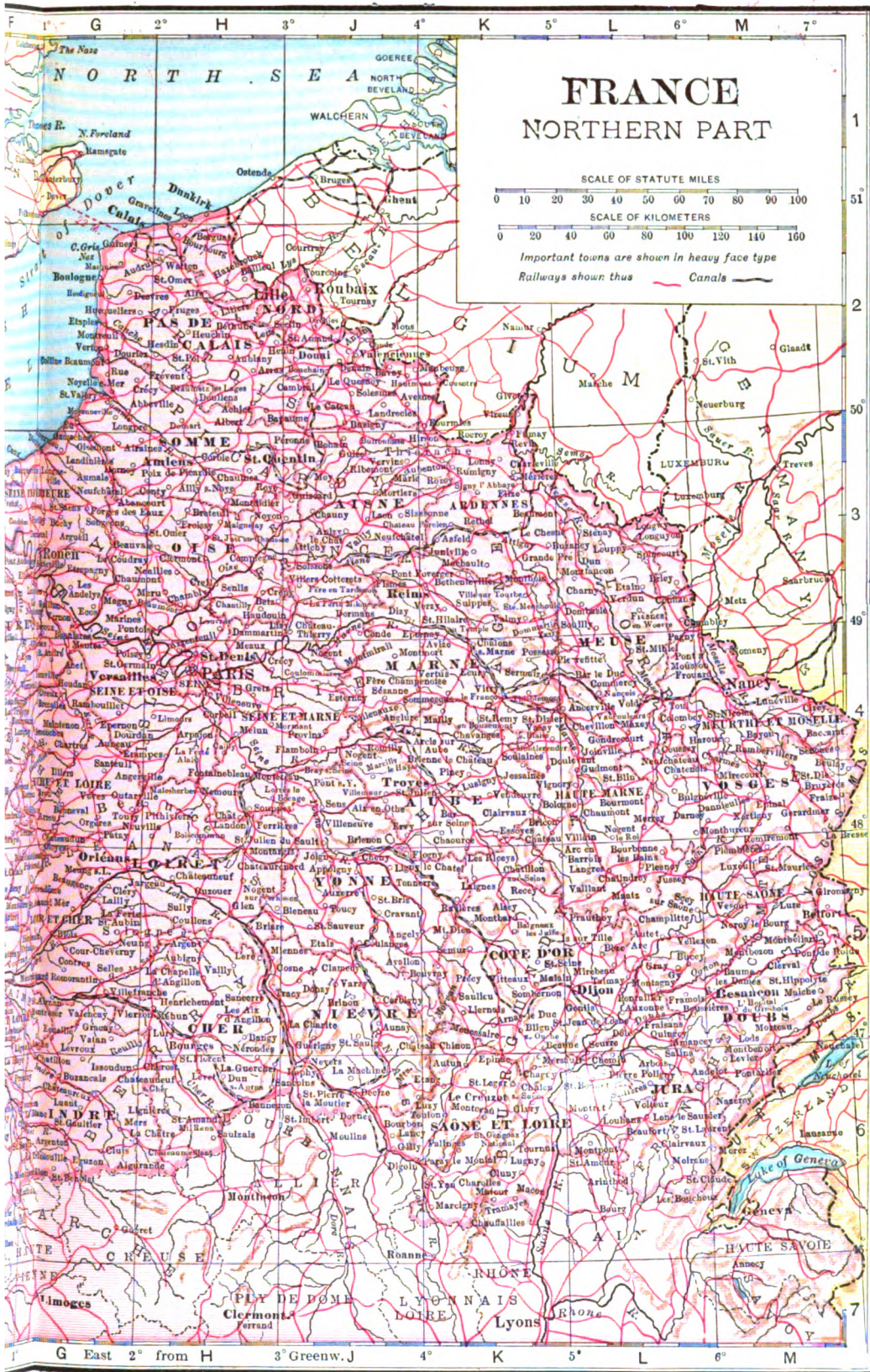
Some of the principal cities, with their communal population in 1911, are as follows: Paris, 2,888,110 (1,053,262 in 1851); Marseilles, 550,619; Lyons, 523,796; Bordeaux, 261,673; Lille, 217,807; Nantes, 170,535; Toulouse, 149,576; Saint-Etienne, 148,656; Nice, 142,940; Le Havre, 136,159; Rouen, 124,987; Roubaix, 122,723; Nancy, 119,949; Reims, 115,178; Toulon, 104,582; Amiens, 93,207; Limoges, 92,181; Prest, 90,540; Angers, 83,786; Tourcoing, 82,644; Nîmes, 80,437; Montpellier, 80,230; Rennes, 79,372; Grenoble, 77,438; Dijon, 76,874; Tours, 73,398; Calais, 73,322; Orléans, 72,096; Saint-Denis, 71,759; Le Mans, 69,361; Levallois-Perret, 68,703; Clermont-Ferrand, 65,386; Versailles, 60,458; Besançon, 57,978; Boulogne-sur-Seine, 57,027; Saint-Quentin, 55,571; Troyes, 55,486; Boulogne, 53,128; Béziers, 51,042; Avignon, 49,304; Lorient, 49,039; Caen, 46,934; Clichy, 46,676; Bourges, 45,735; Neuilly-sur-Seine, 44,616; Cherbourg, 43,731; Montreuil, 43,217; Asnières, 42,583; Villeurbanne, 42,526; Saint-Ouen, 41,904; Poitiers, 41,242; Perpignan, 39,510; Belfort, 39,371; Dunkerque, 38,891; Vincennes, 38,568; Ivry, 38,307; Saint-Nazaire, 38,267; Angoulême, 38,211; Courbevoie, 38,138; Aubervilliers, 37,558; Pau, 37,149; Roanne, 36,097; La Rochelle, 36,371; Pantin, 36,359; Douai, 36,314; Le Creusot, 35,587; Rochefort, 35,019; Valenciennes, 34,766; Montluçon, 33,799; Périgueux, 33,548; Cette, 33,049; Puteaux, 32,223; Lenc, 31,812; Chalons-sur-Saône, 31,550; Châlons-sur-Marne, 31,367; Arles, 31,010; Carcassonne, 30,889; Laval, 30,252; Epinal, 30,042.

EDUCATION. The educational system is highly











developed. Under control of the central administration are the ministry of public instruction; the Superior Education Council, charged with the actual administration; the Consultative Committee (advisory); educational bureaux and inspecting staffs, whose heads report direct to the minister. Under local administration are territorial academies, with inspecting staffs for all grades, and departmental councils, presided over by the *prefet*, charged especially with primary education. By the law of July, 1904, all congregationist institutions were to be suppressed within 10 years, and many were at once closed, some reopening under lay management. Primary instruction is secular, compulsory, and free between the ages of 6 and 13. Schools include (a) infants; (b) lower primary; (c) higher primary. There are supplementary courses, and courses for adults. Lower and higher primary certificates are granted. Numerous private courses are aided from local funds. Schools are for boys, for girls, or mixed. Secondary schools include state lycées, communal colleges, and many private establishments, with a seven-years' course, either (a) purely classical; (b) purely modern; (c) Latin and sciences; or (d) Latin and modern languages. The degree of bachelor is conferred on completion. For females a similar organization exists; course five to six years. Especially well known are the schools at Sèvres and the Sorbonne. Special schools are very numerous, many public institutions being dependent on ministries other than that of public instruction. State universities alone grant university degrees, but numerous private faculties and private institutions further higher education, as those at Aix, Algiers, Angers, Bordeaux, Caen, Clermont, Dijon, Grenoble, Lille, Lyons, Marseilles, Montauban, Montpellier, Nancy, Nantes, Paris, Poitiers, Rennes, and Toulouse.

**AGRICULTURE.** Out of the total area of the country as given by the ministry of the interior—52,955,764 hectares—23,678,846 hectares are given as under grape crops and sown meadows, 4,884,400 under natural meadows, 1,568,030 under forage grasses, 3,610,430 under pastures, 1,684,523 under vines, 3,909,480 uncultivated lands, 1,372,486 in rosaries, shrubberies, market gardens, etc., 9,329,193 under forests, and 2,916,376 hectares put to various uses not included in any of the foregoing.

Official sources of information for the current year being unavailable on account of the war, we have derived figures for areas (in acres) under main crops and production (in metric tons) from a British source.

	Acres		M. Tons	
	1914	1915	1914	1915
Wheat . . . . .	15,382	14,229	7,870,321	6,472,020
Mixed grains . . . . .			133,976	114,210
Rye . . . . .	2,578	2,700	1,138,326	992,820
Barley . . . . .	1,781	1,852	1,004,493	786,275
Buckwheat . . . . .				
Oats . . . . .	8,549	9,204	4,665,472	3,746,220
Corn . . . . .				
Potatoes . . . . .			11,992,718	9,057,092
S. beets . . . . .			3,751,066	1,508,283
Tobacco . . . . .			24,173	15,491
Wines * . . . .	3,811,555	3,807,982	1,316,849	448,819

\* Production figures are in thousands of gallons of wine.

It will be seen that the figures are far from complete. The production of cider in 1915 is

given as 649,154,000 gallons; wine import, 184,866,000 gallons; wine export, 22,286,000 gallons. In 1915 the total production from silk-worm eggs put into incubation was 1,727,326 kilograms (4,423,046 in 1913), valued at 4,243,027 francs (15,655,016 francs in 1913). Live stock July 1, 1915, included horses, 2,227,209; mules, 152,266; donkeys, 337,244; cattle, 12,286,849; sheep, 13,483,189; goats, 469,487; swine, 5,490,796. In view of the speculation concerning food supplies in the belligerent countries, the following table of visible supplies of grain—stocks of cereal products stored in customs warehouses on August 31st of the years indicated—may be of interest (quantities in quintals):

	1916	1915	1914
Wheat, etc. . . . .		14,615	848,129
Barley . . . . .	4,683	1,995	38,543
Oats . . . . .	1,803	195	75,764
Corn . . . . .	63,928	1,947	147,032
Flour . . . . .	2,468	13,087	19,892

See AGRICULTURAL EDUCATION; AGRICULTURE. **MINING AND METALS.** The mineral resources are comparatively small. They include, however, coal (40,843,618 metric tons in 1913), iron ore (21,714,000), copper (242 tons in 1912), lead and silver (13,953), antimony (11,018), zinc (45,929), and salt (1,098,515). Production of pig iron (1913), 5,311,316 tons; worked steel, 4,635,166.

In 1912 there were 1459 conceded mines, covering an area of 1,166,353 hectares, of which 469, covering an area of 596,262 hectares, were in operation. In these mines, 236,966 persons were employed—168,358 underground, 68,608 at surface. Total estimated number of work days, 67,991,633; total estimated wages, 358,001,473 francs. Total output, 62,284,573 tons, valued at 775,403,262 francs at the pit's mouth. The quarries employed 134,087 work people; output, 53,279,845 tons, valued at 293,623,038 francs.

**MANUFACTURES.** Among the most important manufactures are watches, jewelry, cabinet-work, carving, pottery and glass, chemicals, dyes, paper, woolens, carpets, linen, silk, and lace. The sugar works employ over 32,000 persons, and the yield in 1914-15 was estimated at 302,961 tons—a falling off from the year preceding which showed a yield of 877,656 tons.

**COMMERCE.** By presidential decree dated July 31, 1914, the exports of all kinds of farinaceous foodstuffs and fodder had been prohibited since the decree was communicated to the prefects. By presidential decree dated Oct. 18, 1914, the export of cotton and cotton waste has been prohibited since October 19th. Exceptions to these orders may, however, be granted.

By an order of Aug. 22, 1915, raw cotton was declared contraband of war. The export of oleaginous fruits and seeds has been prohibited to all countries except the United Kingdom, British dominions, colonies, and protectorates (including Egypt), the uninvaded territory of Belgium, Japan, Russia, and American countries.

The ministry of finance is empowered to grant permission for export of certain articles to the Netherlands, provided that they are consigned to the Netherlands Overseas Trust. Permission may also be granted for export to Switzerland in respect of a considerable number of articles such as wheat, corn, oats, barley, rye,

rice, flour, cotton, fodder, etc. Consignment must be made to the *Société Suisse de Surveillance Economique*.

The principal imports are wool, cotton, coal, silk, oleaginous fruits and seeds, machinery, raw skins, copper, timber, wines, coffee, rubber, cereals, and minerals. The principal exports are cotton tissues, silk tissues, wool, woolen tissues, wines, silks, millinery and artificial flowers, automobiles, raw hides, tools and metal goods, dressed skins, machinery, ladies' made-up garments, chemical products, pig iron and iron and steel, woolen yarns, raw rubber, butter, and refined sugar.

Official figures for the trade of the current year are lacking and 1915 figures are subject to revision. (See below, paragraphs on *History*.) The following table gives special trade for comparative years in thousands of francs:

	1913	1914	1915
Imports .....	8,421,800	6,402,200	8,074,500
Exports .....	6,880,200	4,868,800	3,022,800

The next table shows values of important articles in the special trade for comparative years, and exhibits significant fluctuations (values in millions of francs):

Imports	1909	1910	1913	1913	1914	1915
Wool .....	684.4	658.9	684.6	698.8	526.1	166.8
Cotton .....	494.7	469.8	567.1	541.2	356.8	396.6
Coal, etc. ....	442.1	400.7	501.4	575.2	441.6	474.8
Raw silk .....	831.5	846.3	567.1	541.2	258.9	209.8
Rubber .....	208.8	320.1	218.7	199.5	81.4	81.9
Cereals .....	152.9	301.3	366.8	613.4	564.5	800.2
Wines .....	123.8	296.5	321.0	276.6	240.7	262.0
Machinery .....	216.2	247.5	301.6	328.7	213.6	132.5
Skins, etc. ....	199.3	206.9	222.3	238.5	177.5	72.0
Timber .....	183.2	165.9	177.2	186.9	117.4	51.0
Copper .....	123.6	180.6	197.1	207.0	150.6	201.2
Coffee .....	113.8	126.4	216.9	234.8	308.2	239.2
Flax .....	81.2	82.4	114.7	122.9	75.5	2.1
Oil seeds .....	292.1	379.7	17.0	10.5	349.6	253.7
Petroleum .....			144.9	144.9	125.6	121.6
Chem. products. ....				138.6	106.5	118.6

Exports	1909	1910	1913	1913	1914	1915
Raw wool .....	337.7	341.4	865.5	294.2	248.2	20.1
Silk .....	316.9	332.8	292.3	374.2	313.9	329.3
Cottons .....	332.0	328.2	384.7	367.4	276.9	152.4
Wines .....	214.4	248.3	228.8	200.8	132.6	104.9
Woolens .....	212.1	212.5	190.7	211.3	153.1	13.4
Raw silk .....	164.0	133.6	147.7	161.7	146.9	125.4
A. de P.* .....	178.3	172.7	184.6	190.8	130.3	103.8
Automobiles .....	146.0	161.9	207.1	217.5	130.3	51.6
Skins .....	141.5	133.7	321.2	315.7	117.1	54.1
Metals .....	99.1	102.4	118.8	125.0	84.5	32.2

\* Articles de Paris.

In the following table are shown the principal countries of origin and destination, special commerce, values in thousands of francs:

	Imports			
	1911	1913	1914	1915
U. K. ....	1,020,827	1,113,100	870,000	1,914,400
Germany ...	965,086	1,068,800	593,900	5,300
U. S. ....	883,138	894,700	787,600	2,272,900
Belgium ...	533,001	556,200	316,400	15,800
Algeria ....	457,540	330,800	312,800	436,000
Russia ....	412,641	458,100	311,200	50,700
Argentina ..	364,375	369,200	217,100	353,400
Spain .....	227,745	281,500	195,800	461,100
Italy .....	187,377	240,500	173,900	335,000
Brazil .....	155,961	174,200	160,500	189,400
Switzerland .	142,153	135,200	101,900	168,000
Turkey ....	100,177	99,600	77,300	8,700
Aus.-Hun. .	86,180	103,400	60,900	2,500
Other .....				
Total ....	8,160,667	8,421,300	6,489,200	8,074,500

Exports

	1911	1913	1914	1915
	U. K. ....	1,246,980	1,453,800	1,153,700
Germany ...	819,061	866,700	493,500	.....
U. S. ....	869,595	422,600	375,700	380,960
Belgium ...	1,002,568	1,108,400	603,900	27,500
Russia ....	55,461	83,200	60,900	50,600
Argentina ..	171,917	199,900	93,300	80,800
Spain .....	137,610	151,200	111,400	108,100
Italy .....	283,274	305,700	213,500	265,300
Brazil .....	73,332	86,300	39,100	41,900
Switzerland .	402,949	406,100	299,600	254,300
Turkey ....	82,156	83,200	72,500	.....
Aus.-Hun. .	46,208	43,800	32,000	.....
Algeria ....	484,628	552,500	437,300	291,900
Other .....				
Total ....	6,172,077	6,880,200	4,824,500	3,022,300

SHIPPING. The number of ships, French and foreign, with their aggregate tonnage, entered and cleared, exclusive of coasting, during the years 1912 and 1913, are shown below:

	1912		1913	
	No.	Tons	No.	Tons
Entered:				
French ...	8,093	7,581,374	8,167	8,308,165
Foreign ..	21,793	23,721,433	21,751	26,200,791
Total ..	29,886	31,302,807	29,918	34,508,956
Cleared:				
French ...	8,338	7,763,518	7,263	7,473,230
Foreign ..	21,766	23,709,449	14,393	18,636,188
Total ..	30,004	31,472,968	21,651	26,109,418

Of the total tonnage entered, 8,571,244 tons were registered at Marseilles, 4,592,658 at Cherbourg, 3,849,563 at Le Havre, 3,478,481 at Boulogne, 2,284,666 at Rouen, 2,007,302 at Bordeaux, 1,680,084 at Dunkerque, 1,225,310 at Calais.

Merchant marine, Jan. 1, 1913: 15,813 sailing vessels, of 614,024 tons; 1857 steamers, of 904,494—total, 17,670 vessels, of 1,518,518 tons. On Jan. 1, 1907, the mercantile marine, comprising boats of two tons and upwards, amounted to 16,999 vessels of 1,390,542 net tons (of which 15,488 were sailing ships, representing 677,055 net tons). See below, paragraphs on *History*, also articles SHIPBUILDING and SHIPPING.

COMMUNICATIONS. The system of railways in France is very extensive; they are almost entirely *concedés*, and become state property after the expiration of the concession. There were reported in operation Dec. 31, 1913, 40,786 kilometers of main railway lines, and 10,645 of local lines.

The military and industrial conditions of France during 1916 were closely dependent upon the railway, and such military achievements as the holding of Verdun were only possible by the supplies of artillery, munitions, and troops brought forward by rail. France is supplied by six railway systems with a total mileage of 25,000, which radiate from Paris and by means of the Grande Ceinture, a strategic railway which circles the capital at an average distance of 10 miles, these can be worked together as a single unit. It was built with an original capital of \$12,000,000, \$3,000,000 of which was advanced by the government and normally earned about \$100,000. Fortunately laid with heavy steel rails on a well built roadbed it has well served its purpose. This road was constantly used in the transfer of troops. Thus, troops from the south of France via the Paris-Lyons-Mediterranean Railway were sent to the Northern

Railway and the front by the Grande Ceinture. There were ample freight and passenger terminals within Paris and these again facilitated operations.

With many railway employees serving with the armies women had taken the places of men to a large extent, and it was stated that exclusive of the Nord and Est or the light and secondary railways, i.e., taking only the so-called "interior systems," 32,000 women were in the railway service on July 1, 1916, and the number was increasing. On the state railways, women numbered at the beginning of July, 10.8 per cent of the pre-war staff; on the Paris, Lyons, and Mediterranean, 12.3 per cent; on the Orléans, 14 per cent; and on the Midi the figure was given as high as 16.7 per cent.

As showing the extraordinary conditions due to the war it was stated that a number of Serbian railway men were working at various railway centres in France. Altogether, the Paris-Orléans and the Paris, Lyons, and Mediterranean companies have 500 of these men.

Railway receipts in 1916 showed a remarkable resumption of prosperity, the total for the Western, the Paris, Lyons, and Mediterranean, Orléans, and the Midi railways reaching \$144,000,000 for the first six months of the year 1916, as against \$123,400,000 for the first half of 1915. This total actually indicated an excess of \$13,600,000 over peace time; that is, for the first six months of 1914. A great portion of the Northern Railway system and some part of the Eastern Railway system at the end of 1916 were in the hands of the Germans, and both systems were almost entirely in the military zone. Nevertheless, the Northern receipts reached \$23,800,000 for the first half of 1916, as against \$14,800,000 for the corresponding period of 1915; and the Eastern receipts for the same period were \$22,800,000 for 1916, and \$15,200,000 for 1915.

**FINANCE.** The French government has been compelled to borrow from the Bank of France, the conditions of the Paris money market making borrowing on a national scale impossible. When war was declared, French credit was in a disorganized condition owing to a newly issued *rente* loan. On Oct. 7, 1915, the Bank of France had advanced to the state £276,000,000, and issued notes of £546,563,400, against a gold holding of £184,053,600. The French exchange has been favorable to London (October, 27.30 francs to the £1, or 2 francs above normal). See below, under *History*, also the article **FINANCIAL REVIEW**.

In the table below are shown actual revenue and expenditure for two years, with estimates for 1914 (in francs):

	1911	1912	1914
Revenue	4,689,045,845	4,857,491,193	3,984,106,936
Expend.	4,547,015,741	4,742,756,094	5,191,643,085

A comparative table for 1914 and 1915, showing details of the budget for those years, may be of interest at this time. Amounts are in francs.

Revenue	1914	1915
Direct taxes	635,931,436	613,806,726
Registration	615,011,000	463,594,500
Stamps	195,952,000	146,167,500
Exchange	5,718,500	1,812,000
Income tax	153,340,000	157,782,000
Customs	577,613,000	764,144,000

Revenue	1914	1915
Indirect taxes	562,108,000	477,069,000
Mineral oil	1,455,000	227,000
Sugar	181,908,000	236,617,000
Tobacco	517,687,000	502,349,000
Matches	89,572,000	40,839,000
Lighters	585,000	950,000
Gunpowder	12,333,000	3,091,000
Posts, tels. and tels.	859,965,300	289,861,000
Various	919,100	565,200
Domains, etc.	124,008,600	185,681,100
Total	3,984,106,936	3,883,971,126

Expenditure	1914	1915
War	1,203,659,712	16,178,118,293
Debt charge	1,306,585,021	1,827,393,673
Administration	20,006,738	20,145,038
Finance	389,248,907	438,041,954
Justice	61,017,461	58,002,623
Foreign affairs	22,879,749	32,695,592
Interior	176,949,513	716,242,003
Marine	513,542,521	707,641,282
Merchant marine	97,368,267	83,177,990
Instruction	347,810,375	358,644,472
Fine arts	21,839,189	20,465,195
Com. and Ind.	17,948,374	135,151,211
Labor, etc.	106,718,809	165,079,845
Posts and tels.	362,635,135	405,524,777
Colonies	109,724,180	153,578,837
Agriculture	74,769,222	65,838,473
Public works	358,944,913	607,809,214
Total	5,191,643,085	21,961,462,479

The special-services budget balanced at 816,329,331 francs for 1913. The total debt, Jan. 1, 1914, stood at 32,880,809,509 francs, of which the floating debt was 1,432,412,800 francs (October 1st). See **BANKS AND BANKING**; **FINANCIAL REVIEW**.

**ARMY.** See **MILITARY PROGRESS**; **WAR OF THE NATIONS**.

**NAVY.** See **NAVAL PROGRESS**; **WAR OF THE NATIONS**.

**GOVERNMENT.** The republic was proclaimed Sept. 4, 1870. The constitution is that of Feb. 24, 1875, amended Aug. 2 and Nov. 30, 1875, Dec. 9, 1884, June 16, 1885. Two chambers compose the National Assembly, which convenes annually. Three hundred members, aged not less than 40 years and elected by delegates for nine years, make up the Senate. There remained in 1912 only three of the life members elected by the Assembly, previous to the introduction of the present system. The members (597; one to every 70,000 inhabitants) of the Chamber of Deputies are elected for four years by direct popular vote. The President (1913-20, Raymond Poincaré) is elected for seven years by the Assembly, by an absolute majority of votes. His cabinet, responsible to the legislative body, is chosen by himself; in the majority of cases it is made up from members of one or other of the two chambers, but not necessarily so.

## HISTORY

**CRITICISM OF THE MINISTRY.** The most engrossing questions during the year 1916, as in the preceding year, centred about the authority of the high command and the enforcement of parliamentary control. Socialists and Radical Socialists complained again on February 18th that the general staff had been entrusted with too much power. A motion introduced by M. Abel Ferry called upon the government to exercise its authority in the zone of the armies. The conditions were said to be unfavorable to military efficiency, since authority was so divided in the army zone that military headquarters had become a sort of ministry and General Joffre was

overwhelmed with administrative work. M. Briand declared that inasmuch as the government was already exercising control in the army zone, the motion if it meant anything, meant that the government was not doing its duty. If therefore the Chamber insisted on discussing the measure the government had no other recourse than to resign. He said that a general debate would be harmful to the country at large as implying that dissensions existed in the government. The Chamber passed a vote of confidence by a majority of 394. Later, however, in June the Premier agreed to the parliamentary request that the military situation should be explained in confidence, and secret sessions lasting several days were followed on June 22nd by a renewed vote of confidence, 440 to 97, and by the resolution of the Chamber by a vote of 444 to 80 to refrain from interfering in the control of military operations but to assume charge of industrial and military preparations. The Senate also held secret sessions on July 3rd and voted almost unanimously in support of the government, though there were some very influential members in the Opposition, among them MM. Pichon and Clémenceau. The majority of the Socialist party remained faithful to the government's war policy despite the opposition of certain prominent Socialists in Parliament. In December, 1915, the Congress of the Unified Socialists had passed a resolution favoring the prosecution of the war till German leadership had been overthrown and Alsace-Lorraine regained, and on April 9th the National Council of the Socialists voted by a large majority against the renewal of relations with Socialist groups in enemy countries. An important change in the ministry resulted from the resignation of the Minister of War, General Gallieni, on account of ill-health on March 16th; he was succeeded by General Pierre Auguste Roques. General Gallieni died about two months after his resignation.

**SOLIDIFICATION OF THE ENTENTE.** On February 10th, the French Premier, M. Briand, with two members of his cabinet made a visit to Rome where he was received by the Italian Foreign Minister, Baron Sonnino. The purpose of the visit was to insure perfect accord between Italy and the Entente Allies, and especially more complete unity of action both in a military and a political sense. It looked to a later Allied conference and to the establishment in the future of what should amount to an Allied General Staff. The war council of the Allies, held in Paris on March 28th, adopted unanimously a series of resolutions looking to the consolidation of the Allies and unity of action in the economic and diplomatic fields as well as in the military, and providing for an economic conference.

**TRADE AFTER THE WAR.** Early in the year there was much discussion of the policy to be pursued after the war in regard to trade relations between the Allies, and the French Chambers of Commerce were required to express their views, and then submit them to an Association of British Chambers of Commerce. (See *GREAT BRITAIN, History*.) At the Interparliamentary Economic Conference at Paris, April 26th-29th, closer economic union between the Entente Allies was urged, and it was recommended that the losers in the war should pay the damages and that measures should be taken against the alleged policy of "dumping" on the part of the

Central Powers. Before the meeting of the Economic Conference of the Allies in Paris (see following paragraph) French public opinion was focused upon the various measures to check German commercial advance after the war. The treaty of Frankfurt was destroyed by the war, and France was determined never to fall again into that position of commercial vassalage which the treaty had caused. The means by which this was to be avoided were, first, a tariff war against "dumping," second, a campaign against any sort of subsidizing measures whereby German shipping obtained an advantage, and third, the prevention of the establishment of commercial associations which really covered a system of espionage. Much was made of the alleged plan of Germany to carry on a great "dumping campaign" after the war. This, it was said, was to be done by the exportation of large quantities of cheap goods which were even now in readiness, and which were to be given in exchange for raw materials. The Germans, it was said, hoped to regain at once their lost markets. It was alleged that manufacturers' associations of a new kind had been formed in Westphalia, Bavaria, and Saxony aiming at a union of efforts to prevent wasteful methods of marketing, that makers of optical and surgical instruments and of a great variety of machines were also incorporated, and that the amount of commodities in store for this future "dumping" process was already very large.

**ALLIES' ECONOMIC CONFERENCE.** The results of the Economic Conference held from June 14th to June 17th inclusive were received with much gratification by the French public. Certain optimists went so far as to see in it a step toward the United States of Europe. The comments in brief upheld the decisions of the Conference and urged that not merely defensive measures, but aggressive plans should be undertaken to paralyze German trade. The Conference showed the willingness on the part of the respective members to give way to one another's wishes, and a spirit of harmony prevailed. See *WAR OF THE NATIONS*.

**SCARCITY OF SHIPPING.** The heavy freight charges resulting from war conditions were the subject of much discussion during the year. Before the war the French merchant marine held fifth place among the nations of the world and its tonnage was about 2,500,000, as compared with 21,000,000 for the British merchant marine, and about 12,000,000 for the neutral nations. On account of the drafting of vessels into the government service as well as the losses during the war, the French merchant fleet by the summer of 1916 had scarcely more than a tonnage of 1,000,000. Hence, while under normal conditions the exporters could choose between different vessels, now they were obliged to compete with each other, and the consequence was that freights rose enormously. Many ways of dealing with the situation were proposed. There was much criticism of the shipowners, on the ground that they took advantage of the crisis to make extortionate demands. On the other hand, it was pointed out that the conditions themselves by the operation of economic laws necessarily forced the prices up. At the conference of the Entente Allies in Paris on March 28th, the fourth resolution adopted, as noted above, was directed in a general way toward this problem. It decided to organize at



London a central international bureau on freight rates, and to seek some means of sharing in a fair manner among the Allies the heavy charges resulting from present conditions and of lowering the cost of freight. Under normal conditions only 25 per cent of the tonnage in French ports is under the French flag. In the summer of 1916 the proportion had greatly diminished, since more than half of that tonnage had been absorbed for military necessities and the invasion of the richest portion of France had caused a great demand for foreign produce and for foreign transport service. Hence if the government requisitioned the French merchant vessels or reduced the taxes on the small number that remained, no great benefit would result to the consumer. On April 4, 1916, the French government issued a decree for the purpose of making sure of the best possible employment of the ships and forbade, first, voyages from one foreign point to another foreign point; second, voyages from France which did not have any advantage in regard to the provisioning of the country. Some suggested that the only remedy, and it was a difficult one, was to increase the number of ships by building new ones. See SHIPBUILDING and SHIPPING.

**INCREASED COST OF LIVING.** As indicating the reasons for the increased cost of living in France, the following points were mentioned: One reason for the high prices was the increase in the credit circulation, which had risen from 6,000,000,000 francs in 1914, to about 16,000,000,000 in 1916. There were signs of imprudence and increased consumption among the population. At the beginning of the war there had been a tendency toward strict economy, but after a short time, the country having more money in circulation, the people began to spend more. At the same time the national production decreased in all fields on account of the lack of skilled workmen. In 1916 it was reported that the land planted to crops had diminished 740,000 hectares since 1915, and as a result of the lack of insufficient tillage and fertilizers, the average production per hectare had largely decreased. The production of French sugar was reported to have fallen between 1912 and 1915 from 876,000 tons to 303,000, chiefly on account of the loss of the most fertile sugar producing tracts. Moreover, the invasion had robbed France of her richest coal mines, reducing the output from 40,000,000 to 20,000,000 tons. Two-thirds of the coal fields were in the hands of the Germans. As a result of these conditions, France necessarily had recourse in large measure to importation, and in 1915 the value of imports had exceeded that of exports by 5,500,000,000. In 1916, at the end of October, the excess was reported at 11,000,000,000. The imports of wheat alone were placed at 8,800,000,000. All these heavy expenses and the still more severe pressure of war cost lowered the national credit and reduced the rate of exchange. Toward the close of 1916, the franc no longer had its customary value abroad. As a result of the necessary use of vessels for the importation of provisions, there was the above-mentioned scarcity of shipping. It was estimated that one-half of the British merchant fleet and the whole of the German, Austrian, French, and Italian fleets were withdrawn from international trade either on account of requisitions or on account of the blockade. Again, the submarine war rendered the transit of merchant

vessels more and more dangerous. Similar scarcity was felt in means of land transport. In the northern department of France the Germans had taken 50,000 of the French cars, while the needs of the French army itself withdrew much of the French rolling stock. See FINANCIAL REVIEW, paragraphs *Foreign Trade and France*.

**THE CENSORSHIP.** Throughout the year there were severe criticisms of the methods employed by the censorship, and in May notice was given of an interpellation of the government on the subject. M. Briand, however, begged the Chamber to forego that discussion as it exasperated public opinion. He went on to show the absolute necessity of confidence in the government and said that if there were not confidence in the present government it ought to resign and make way for others. The discussion was postponed (May 18th). The objections to the censorship were that it was ill exercised and needlessly exasperated the journalists, causing ill feeling between them and the Chamber. And inasmuch as they would have their revenge as soon as it was removed, the policy seemed especially unwise. It was complained that the censorship suppressed without discrimination and allowed serious things to go through while crucifying trifles. An instance was given of a caricature which represented the Premier as a juggler tossing in his hands the head of M. Clémenceau. The censorship forbade its appearance. The author took it to M. Clémenceau who said he had not the slightest objection to its publication, but when the illustrator took it back again to the office of censorship they persisted in their refusal. Upon the reorganization of the government at the close of the year a modification of the censorship was promised. See below, paragraph, Government by Decree.

**THE OCCUPIED TERRITORY.** Parliamentary investigation into the damage done in the departments occupied by the Germans was carried on at the end of July. According to the figures given, 2554 of the 36,247 communes into which France is divided, that is about 7 per cent, were still held by the Germans, and 247 had been completely cleared of their inhabitants, owing to their proximity to the seat of military operations. Owing to the strict German censorship precise and trustworthy details could not be had as to the conditions in the parts of France held by the enemy, but many rumors were circulated indicating that the sufferings were severe and that German methods were needlessly harsh. In Lille, for example, the great industrial city in Northern France, and one of the richest in the whole country, it was reported that all commercial activity had virtually ceased, that the inhabitants were suffering severe privations, and that a reign of terror prevailed. The deportations in that department were placed at several thousands. In Lille alone, it was said, men, women, and children were snatched from their homes and taken to unknown destinations. Among the restrictions noted were the following: People were not permitted to walk abroad after eight o'clock in the evening or to have a light. No one could carry a package of any sort or exchange correspondence even within the limits of the city, the posts being exclusively reserved for the Germans. Business could not be carried on except under German control and all the factories other than those used by the invaders for war purposes were closed. In some

of the establishments in the outskirts workmen were led to work at the point of the bayonet. Householders were required to bring to the officer in command all their metal utensils. But for the provisions distributed by the Spanish-American Committee and certain aid rendered by the Dutch Committee, the population would have been without means of subsistence. Meat had completely given out and it was forbidden to slaughter any animal, even an old horse. All the horses that remained had to be brought for inspection in good condition under the penalty of a high fine, despite the scarcity of forage. Every inhabitant, rich as well as poor, was required to have a provision card. Without waiting for peace, the French government made preparations to restore normal conditions as soon as possible in the regions occupied by the Germans. It sent out circular letters to the prefects of the invaded departments, declaring that everything must be done at the earliest possible moment for the reestablishment of normal conditions, and all questions pertaining to that end should be studied in advance, and a commission was appointed by the government under the presidency of M. Léon Bourgeois, former member of the cabinet. Plans were considered for providing for the return of the refugees after the enemy had left the territory, for the sending of portable houses into the devastated regions in the North, and for provisioning after the war. A central bureau was established at Paris, and the ministry of commerce was to have charge of the measures for the restoration of industrial conditions.

**THE GERMAN REPLY.** The charges in regard to the deportations were embodied in the French foreign ministry in a pamphlet entitled *The Germans at Lille and in the North of France*. The German reply, reported in the newspapers as official, characterized the charges as slanderous. It declared that although the deportation of some 20,000 inhabitants of Lille, Tourcoing, and Roubaix had taken place in the latter part of April the French government, though it must have known of it from the first, had waited three months before taking any stand in the matter. The German defense gave the following account of the measure: In those three populous towns there was increasing difficulty of feeding the inhabitants, despite the work of the Spanish-American Relief Committee. Foodstuffs from Germany could not be distributed in sufficient quantities on account of the illegal British blockade. Moreover, there was no knowing how long American supplies would be allowed by the British to enter. A drastic course was therefore necessary. A proclamation was issued giving the reasons, and saying that the people were to be taken into the interior, far from the front, were to be employed at farmwork, not on work of any military character, were to receive pay, and were to be guaranteed their sustenance. The towns were full of people out of work; the rural regions were suffering for lack of labor, and labor was indispensable to insure the harvest. Due regard was paid to exemptions. Young girls were not deported unless they were accustomed to earn their own living by work. Delegates of the Red Cross were present at the selection. It further went on to say that the majority of those who were deported appeared, from their own statements, to be by no means dissatisfied with their condition. It declared

that the measure was justified from the point of view of international law by Article 43 of the "Regulations Respecting the Laws and Customs of War on Land," adopted by the Hague Convention, declaring that the occupying authority should "take all the measures in its power to restore and insure so far as possible public order and safety."

**THE ARREST OF ROCHETTE.** Late in the autumn it was announced that Henri Rochette, the notorious financier, convicted of crooked dealings in 1912, and since then a fugitive from justice, was arrested at Granville, where he was serving in the automobile reserve of the army. From the time when he disappeared from Paris, Dec. 19, 1912, the constant efforts of the police to trace him had been fruitless, though the search was carried on in all parts of the world. It turned out that he had been in France ever since the beginning of the war. The circumstances were as follows: In August, 1914, when the war fever was at its height, M. Hervé, editor of the *Victoire*, turned the office of his newspaper into a sort of haven for fugitives of all kinds, chiefly foreigners caught in Paris and in danger of arrest, merely because they were foreigners. Among them also were many who had had difficulties with the law and wished to rehabilitate themselves by joining the army. This could be done only by fraud, but M. Hervé, believing the end justified the means, collected papers of honorable discharge from his friends and acquaintances and distributed them among these ex-convicts. One day a man of military age presented himself and asked humbly for similar aid. He confessed he was Henri Rochette, that he had been in a place of safety, but that on seeing France invaded he had wished to fight in her defense. He hoped some day, he said, to prove that he had been misjudged. M. Hervé secured from his colleague M. Georges Bienaimé his discharge papers and gave them to Rochette, who enlisted as a motor cyclist on Aug. 16, 1914, and was afterwards promoted to the general automobile reserve and stationed at Granville. There he was arrested by the authorities, and having admitted his identity was taken to the police station at Rouen. All this was freely admitted by M. Hervé, who defended his course, and laughed at the threat of certain newspapers that he would find himself under sentence to hard labor for falsifying the public records. He was condemned by many writers in the press, who also insisted on applying the law in all its rigor to Rochette. They refused to see anything courageous in Rochette's course and attributed the attitude of his defenders to the sentimentality always occasioned by a spectacular criminal. On the other hand, many agreed with M. Hervé. Aside from the question of moral blame, it was argued that the charge of forgery would not stand in law, because according to the penal code and the decisions of the courts the crime of forgery presupposed a design to injure, and there had not been, either on the part of Rochette or on that of his abettors, any sign of such intention.

**WAR FINANCE.** A summary of financial conditions during the year will be found in the article **FINANCIAL REVIEW**, paragraph *France*. In the session of the Chamber on December 11th, M. Ribot, Minister of Finance, presented some interesting aspects and comparisons of the financial measures of the war. In the first place he

attributed to the confidence of the country the fact that now in the 29th month of the war the finances were in sound condition. He gave the following summary: France had borrowed about 49 milliards of which 23½ constituted a consolidated debt. Great Britain had borrowed 70 milliards and he believed that Germany had borrowed fully as much. The actual figures for the last loan were 11,508,000,000 francs. The proportion of currency was 54.62 per cent. The short term debt, but not to be paid till after the war, came to 13 milliards, including the debt to the Bank of France. The floating debt on November 30th was not more than 12 milliards, as compared with the British debt of 27 to 28 milliards. The government had not only been able to meet its interest obligations, but to make its stipulated payments and take measures to maintain the rate of exchange. In this it had received the invaluable support of the Bank of France, which on November 19th had received 1,948,000,000 francs in gold and had expended an equal amount. He declared, however, the need of very vigorous measures for the organization and stimulation of production and the recourse to new taxes. He complained of expenses imposed by Parliament and counseled that body to confine itself to the rôle of control and economy. When its taxes should be presented he feared each one would encounter objections in Parliament and said he wished the government could impose taxes by decree. In reply to some criticism on this score he said the Chamber complained that there was not enough concentration of power in the government. He referred to the loss of time in the discussion and defense of every tax measure in Parliament. He believed in the reform of the government but thought also that the Chamber might do well also to reform its own procedure in some respects.

The extension of the moratorium for three months was decreed on September 20th, and again on December 20th for the three months dating from Jan. 1, 1917.

**FURTHER CRITICISM OF THE GOVERNMENT.** During November the demand for a more vigorous and centralized administration, both civil and military, was at length made openly, and a campaign to that end was conducted in the press. Owing to the censorship the precise grounds of criticism were not generally known, the language on that subject being very vague. Nor were the reforms aimed at described in detail. The newspapers and reviews confined themselves to demanding that the principle "of authority and unity" should be applied, that the best men should be called to the country's service without regard to petty political jealousies, that henceforth there should be perfect frankness toward the nation in regard to the state of affairs, that each nation of the Entente should consolidate its particular government, and that the Entente as a whole should have in its turn a compact central organization which should control all its members.

**PARLIAMENTARY DISCUSSION.** Parliament discussed measures of governmental reorganizations in 10 secret sessions beginning on November 28th. The first open session afterward brought to light some important features of the situation. In the first place, while in the month of June the opposition to the ministry numbered only 97 it had now reached 160 and, in addition, there were a number of other malcontents, so

that it may be estimated that the opposition had doubled in six months. The first question before the Chamber was that of confidence. M. Briand demanded that a resolution expressing confidence in all the acts of the government should be passed. In the discussion that followed there was some sharp criticism and some recommendations whose purport was not generally understood. One of the Unified Socialists, for example, demanded that the impression that Germany was not responsible if the war were prolonged should be removed, and he said that an international organization ought to be established with means of regulating conflicts between the nations, and that before this tribunal any matters of a nature that tended needlessly to prolong the war should be discussed. Another member said the government had nourished the country on illusions and dosed it with chloroform; that it had taken disquieting but ineffective measures; that its lack of foresight had paralyzed activity, especially in the East. He said that France had found herself in a situation as regards Greece (q.v.) which, to say the least, did not advance her prestige. He wanted to know why, when the government had promised the reorganization of the command-in-chief five months ago, it had done nothing on its own account. He twitted the Prime Minister with promising to centralize the government, when it was he who had the idea of a government of 22 members, and he wanted to know how one could expect anything of such inconsistent methods. He concluded with a demand for a complete change of method—in short, for a war government. Another member remarked that in the 29th month of the war, it would be a serious error to let the country think that certain mistakes had been the result of circumstances, for they were in fact due to errors which could have been avoided and which there was still time to repair: namely, lack of organization and foresight, resulting in delay or hasty execution. He accused the government of deferring to Parliament in matters which ought to have been decided on its own responsibility. The government had merely made promises and compromises and it had constantly covered its wavering policy by excuses. Its characteristics were incompetence and lack of will power. The ministry found a defender in M. Millerand, former Minister of War, who warned the Chamber of the bad effect on public opinion that would follow the evidence of a rupture between the government and the Deputies after the long secret sessions. He voted for the ministry because he believed that recent events and the vigorous action of the British ministry (see *GREAT BRITAIN, History*) would impel the government to take such measures as the country required. He said that it was not admissible that vital measures, which had to do at present with the war and would have to do in future with the terms of peace, should be taken in the dark and without responsibility. Another member complained that only half-way measures had hitherto been taken; that when prompt action was necessary there had been deliberation. He held that it was necessary to centralize authority and decide rapidly. One member made the specific suggestion that Parliament should meet in National Assembly, to discuss questions relating to the war. A resolution demanding a fairer distribution of the military burden among the Entente

Allies on the ground that France was putting into the army 1 in 6 of her population, as against 1 in 10 for England, 1 in 11 for Italy, and 1 in 20 for Russia, was voted down, the government majority being 184. A resolution refusing confidence was voted down by 395 to 117. It was couched in the following terms: "The Chamber, facing the facts of the present situation, having witnessed the military, diplomatic, and economic consequences of a feeble and improvident governmental policy, and being resolved to realize the conditions of victory by means of such conduct of the war as corresponds to the efforts of the army and the country, passes to the order of the day." The vote of confidence was then taken and was carried by 346 to 160, 69 not voting. It read as follows: "The Chamber, taking action on the declarations of the government concerning the reorganization of the Command-in-chief, approving its resolve to concentrate under a centralized control the general conduct of the war and the economic organization of the country, trusting to it to obtain in complete harmony with the Allies common sacrifices and efforts recognized as indispensable for obtaining by redoubled energy a definite victory, passes to the order of the day."

**REORGANIZATION.** The chief features in the plan for the consolidation of the government were a change in the high command, the creation of a War Committee, and the reduction of the number of ministers with a view to more compact and centralized administration. The Chamber accepted the first two of these measures on December 7th and on December 9th a law was passed "for the concentration of powers, the simplification of the machinery of administration, and the subordination of all the services to the exigencies of national defense." On December 12th M. Briand announced these changes in the cabinet. A War Committee of five members was to be constituted as follows: Premier and minister for foreign affairs, Aristide Briand; finance, A. Ribot; war, Gen. H. Lyautey; marine, Rear-Admiral Lacaze; national industry, including munitions and transportation, Albert Thomas. In addition to these the other members of the cabinet were: Interior, L. J. Malvy; commerce and agriculture, E. Clémentel; public instruction, P. Painlevé; national subsistence, M. Herriot; colonies, G. Doumergue; justice and public works, R. Viviani. Thus the number of ministers was reduced from 22 to 11. Other important changes were the doing away with five ministers of state, without portfolios, the combining of ministries under single heads, and the calling in of technical experts and business men as deputy-secretaries.

**CHANGE IN THE HIGH COMMAND.** On December 13th the President signed a decree naming General Joffre "technical counsel of the government in regard to the direction of the war." By another decree the commander in chief of the armies of the north and northeast, Gen. Robert Nivelle, and the commander in chief in the Orient, General Sarrail, were made directly responsible to the War Office. By a third decree (December 26th) the President created General Joffre a Marshal of France, and by another on the following day revoked the decree appointing him "technical counsel," as well as the decree of the year before (Dec. 2, 1915) that had placed him in command of all the French armies except those in Morocco and the col-

onies. The office of marshal, of ancient date, was suppressed by the Convention in 1793 but was reestablished under the First Empire. The last marshal to be named, Marshal Lebeuf, was created by Napoleon III in 1870, but while no marshal had been named since 1870, the rank had not been formally suppressed. A law was passed on March 13, 1875, providing for the maintenance of this rank but requiring the passage of a further measure which should fix its conditions. This further measure was never submitted to Parliament. In the session of the Chamber on December 29th there was some criticism of the government on the score of the legality of the decree naming General Joffre marshal. A member, who was applauded by the deputies of the extreme Left, declared this measure wholly illegal. It was argued that the decree had been presented to the French public as requiring to be submitted to the Chamber for ratification, and that if the ratification were postponed General Joffre could not in the meanwhile be legally regarded as a marshal. A vote on a motion brought by one of the critics showed a majority for the government of 401 out of 496.

**COMMENT ON THE RECONSTRUCTION.** At every point in the reconstruction of the government the dissident minority raised objections. There was further criticism when the new cabinet appeared before Parliament on December 13th. M. Briand set forth the aims of the ministry. He said the ministry now comprised a war committee with full powers and capable of prompt decisions and that it would remain in permanent session after having taken the necessary technical advice on all things relating to the prosecution of the war. As to the civil mobilization in Germany, which had been held up as a model, he said that the French government would not force on the country severe measures that would be at the same time ineffective. It would, however, demand the opportunity of requisitioning civilians for the service of national defense, and the authority to regulate by decree the serious question of alcohol. It aimed at the suppression of alcohol in the entire country, and in the army as well. Then followed a discussion in which some sharp attacks were delivered against the ministry. One deputy declared the change in the military command had the effect of dispersing responsibility by placing two authorities side by side: the minister of war and the commander in chief. As to a closer relation with the Allies the government had not said a word. Another characterized the arrangement as a "bastard" and cumbersome solution, and since that was at the basis of the new ministry he urged the Chamber to vote it down. A Socialist deputy called for peace at any cost and demanded that the government should announce the actual objects for which France was fighting. The discussion was then shut off, and upon M. Briand's demand for a vote of confidence, the order of the day was carried by 314 against 165. In general, the attitude of the press toward the measures of centralization taken by the ministry was favorable, though somewhat inclined to criticism. It was evidently the view that such measures should have been taken long before. It was pointed out that ever since the period of mobilization there had been evidence of a lack of efficiency in the administrative machinery. Owing to the division of functions among so many rival services, the officers charged with the needs



Courtesy of Review of Reviews

**ADMIRAL LACAZE**  
Minister of Marine



**GENERAL PIERRE AUGUST ROQUES**  
Minister of War  
March to December, 1916



**ALBERT THOMAS**  
Minister of National Industry  
(Including Munitions and Transportation)



**GENERAL HUBERT LYAUTEY**  
Minister of War  
December 13, 1916

**FOUR FRENCH MINISTERS, 1916**



of defense and maintenance moved slowly and seemed incapable of increasing their pace. M. Clémenceau, the sharpness of whose comments had caused the censorship to suppress issues of his journal, *L'Homme Enchaîné*, declared that France was not betrayed by traitors but by honest men, excellent and conscientious fathers of families, who thought they had fulfilled their entire duty when they filed a document or checked an initiative or impeded some good enterprise by red tape and restrictions. This class was all the more dangerous, said he, because it was so well meaning and so far above suspicion. The critics complained that from the first France had been bound and gagged by the administration. In times of peace they said the French bureaucracy had always shown a tendency to discourage personal initiative. It had thwarted any measures for the exploitation of mines in France and in Algeria, and the result was that France had to purchase its coal and minerals from abroad. The difficulty was that the same administration which served as a check in time of peace was now required to serve as a motive power in time of war. They criticised also the recent measures of paternalism, saying that the government, instead of making use of practical and intelligent business men in the management of the industries pertaining to the war, had turned them out and attempted to conduct these enterprises with men of their own choosing. They found too late that this was a failure, and after having stupidly banished the practical expert, they were now obliged to call him back again. The public, according to these critics, had no desire to revolutionize conditions, but did require an immediate and complete change, whereby new methods would be employed and political considerations would be cast into the background. This was not a time for replacing competent men by theorists chosen for political reasons. Moreover, they demanded that while the censorship should be maintained as regards military or diplomatic information, France should be permitted to think and speak freely. What they looked for in the new ministry was the will to make firm and prompt decisions, the choice of the right men for the work, and, finally, a proper degree of liberty for the expression of public opinion.

**GOVERNMENT BY DECREE.** Pursuant to the policy demanded by the Chamber, and promised in its programme, the government introduced on December 15th a bill demanding authority for proceeding in certain instances by means of decrees and without waiting for the consent of Parliament. The chief points in the bill were as follows: To the end of the war the government was to be authorized to decree in a ministerial council all measures that should be required by the necessities of national defense in regard to agricultural and industrial production, the equipment of ports, provisioning, public health, the recruiting of manual labor, and the sale and distribution of the means of subsistence; such decrees as required the incurring of loans were to be submitted within a week to the Chamber; and that for the violation of such decrees a penalty was to be fixed at not more than six months' imprisonment or a fine of not more than 10,000 francs. The debate that followed brought out some sharp comments from the opposition. There were cries of "A Dictatorship!" M. Briand replied to these attacks

that the government had simply carried out the wishes of the Chamber; that the Chamber had reproached the government for its lack of energy and had compared it with Germany and with certain of the Allied countries, to its disadvantage. The Chamber had said to the government, "Govern on your own responsibility and the Chamber will approve." There were urgent questions which could be settled promptly only by decree. It seemed extraordinary, therefore, that after telling the government to act, certain deputies should oppose that action as dictatorial. If it were necessary to have an act passed in every emergency, if the ministers must appear in the Chamber and answer all objections, it was obvious that the work could not be carried out with promptness and precision. The bill did not apply, he said, to anything not specified in it. No government, he declared, was possible in the present emergency unless it had the right to act promptly, and to oppose this course would check all measures of national defense. The Chamber voted by 308 against 187 to send the bill to a special commission which the Chamber would appoint.

An important measure was brought in for the removal of certain economic abuses by the president of the Commission on Public Economy. The chief point was that to this commission the Chamber should grant complete authority. Such a course was energetically opposed by M. Ribot, but it was carried by a vote of 431 against 69. In considering the vote of credit for the first quarter of 1917 a motion was made for suppressing the item for maintenance of the censorship. There were two motions before the Chamber in regard to the censorship. The first was for the suppression of the political censorship and the other for the suppression of it altogether. The former was carried by a large majority.

There was much division of opinion in the Chamber in regard to the government's new policy. M. Clémenceau referred to Louis Napoleon and the 2nd of December, and declared it a serious blow at parliamentary rule. The different political groups each had its own solution. For example, the Socialist leader, M. Renaudel, believed that the only salvation was a National Assembly. On the other hand, the friends of the government pointed out that it demanded no powers more extensive than it had already exercised at the beginning of the war when Parliament was not in session. They said that the government simply wanted to do what the British government could do under the Defense of the Realm Act. A special group of growing strength was organized for the purpose of openly combating the government under the name of the "National Action."

**IN THE SENATE.** The same question as to the efficacy of the recent changes was raised in the Senate on December 19th. One of the Senators, M. Bérenger, propounded the question whether the reorganization had been real or amounted only to a change in the personnel. He referred to the failures of the government in the past, especially in the East, where it did not seem as if sufficient measures had been taken for coordinating the work of the Allies. He said what the country needed was the concentration of civil and military powers, that the government should have at its head men who were resolute and prompt. The Premier in his reply repeated in

substance what he had already said, pointing to the inconsistency of certain critics who, after demanding a centralized government, cried out against a dictatorship as soon as the government took measures to that end. He declared, however, that he would reply with perfect frankness to any precise and clear question. Discussion followed in secret session.

**CIVIL MOBILIZATION.** At the close of the year Senator Bérenger introduced a bill for the civil mobilization and the organization of national manual labor in France and in the colonies which was based on the following principles: Since England had found it necessary to constitute a national committee on manual labor, and since Germany has organized a civil auxiliary service, there was reason to think that the need of some such measure was no less urgent in France. Its designs were, first, to increase the national production to the degree that was indispensable to the hastening of victory; second, to diminish French purchases abroad and as a result to improve the rate of exchange; third, to assure to France the maintenance of an economic army as the necessary condition of victory. The civil mobilization must include all citizens from 17 to 60 and should be carried out in connection with the departmental bureaus of employment, of which there are many examples, such as those at Nantes, Rennes, Marseilles, etc. The central bureau of employment, which was to be organized as a part of the Department of Labor, was to control the situation as between the departments. The jurisdiction of the civil courts and not the military was to apply to it, the argument for this being that the former courts in the absence of so large a portion of the male population at the front, had little to do and were near at hand. It was argued that the measure would admit of sending to the army many young men now engaged in factories and in services where men unfit for military duty could often be employed. This would result in the reinforcement of both the army at the front and of the economic army in the rear.

It was reported at the end of the year that a voluntary movement was taking place among civilians toward mobilization. The Minister of War, General Lyautey, declared that the longer the war went on, the more urgent were the needs of economy both at the front and at the rear, and that the government would accept coöperation from any quarter. Citizens were requested to move in this matter of their own accord. It was reported that all men exempted hitherto would be mobilized and that the services of boys over 13, but still under the military age, as well as of strangers living in France for a year or more, would be accepted. Many organizations of women were collaborating with the War Department and many women individually were doing office work without pay in order to relieve men that the military authorities could employ otherwise. In the different districts the military commanders informed the recruiting officers of the number of women needed and of the employment that would be given to them. The answers to these appeals were very numerous, and it was said that the women who replaced the men were discharging their tasks with great efficiency.

**FRENCH OPINION OF THE PEACE OVERTURES.** The German note of December 12th, proposing a conference for the discussion of the terms of

peace (see **WAR OF THE NATIONS**), was commented upon in France in a spirit of hostility, suspicion, and contempt, and there was but little evidence of a disposition to take it seriously. M. Briand, in the course of a speech in Parliament, warned the country against it as a clumsy trick. President Wilson's suggestion in the latter part of December that the belligerents on each side should make known the terms on which they insisted and so enlighten neutrals as to the actual purposes of the war, seemed in general to be disapproved, although many commented upon it in a friendly spirit and attributed high motives to an endeavor which, however, they regarded as inopportune, impracticable, and likely to benefit the Central Powers rather than the Allies. When Switzerland followed the example of the United States in asking the belligerents to declare their aims and to consent to a discussion of the terms of peace, there was a tendency in France to suspect joint action among neutrals in this matter, the Swiss note having said that the Swiss government had been for the past five weeks in consultation with the United States government on the subject. French comment pointed to a probable movement among neutrals under the influence of Germany to agitate for peace and hinted at an organized system of pressure to bring about the results aimed at by Germany.

**THE SUPPRESSION OF ALCOHOL.** No part of the ministerial programme, announced after the secret sessions by M. Briand, received more attention than the assertion that the government would ask for power to suppress the consumption of alcoholic liquors. When asked by one of the deputies whether he meant to include the army also, he replied that he meant it to apply to the entire country. There was some speculation as to whether he would carry this policy so far as to prevent production and exportation. In that case it was pointed out it would seriously damage the interests of a large class and put an end to a valuable trade. It was hoped that the war against alcohol would not be carried out in a ruthless spirit, but would be directed solely toward the suppression of consumption in France. Thus limited, the proposal met with general favor.

**OTHER EVENTS.** On April 7th the Chamber passed a law adjourning all elections to the Legislature and all departmental, cantonal elections till after the war. The unpopularity of M. Cailiaux caused his movements to be regarded with a good deal of suspicion. At the close of the year his presence at Rome was interpreted by many as an endeavor on his part to carry out a pacifist propaganda. It was rumored that he had recommended to Italy the policy of a separate peace on the part of Italy and France with Germany, urging that the last-named power was disposed to render generous terms in the circumstances. The French press commented with much severity on his alleged attempts. At the close of the year the members of the Radical and the Radical Socialist party met in the Federation of the Seine to determine measures of reorganization and to consider the present economic situation and the conduct of the war. In regard to the political situation, the Federation declared its approval of the administration of the committees of Parliament which had done so much to supply the troops with the necessary resources, and it protested against the plan of the



government for administering by decrees, on the ground that such a course would rob Parliament of its power of control and would violate the legal guarantees of citizens. It urged Parliament, therefore, while trying to bring about a vigorous conduct of the war, to have due regard to its own rights. See the articles **FRENCH LITERATURE**; **SOCIALISM**; **TARIFF**; **WAR OF THE NATIONS**.

**FRANCE**, JOSEPH I. Elected Republican United States Senator from Maryland, Nov. 7, 1916.

**FRANCESCA DA RIMINI**. See **MUSIC**, *Opera*.

**FRANCIS**, DAVID ROWLAND. An American merchant and former cabinet officer, appointed ambassador to Russia by President Wilson, to succeed George T. Marye, resigned. The nomination was confirmed March 6, 1916. Mr. Francis was mayor of St. Louis from 1885 to 1889, then Governor of Missouri for four years, and Secretary of the Interior under President Cleveland (1896-97). In 1904 he served as president of the Louisiana Purchase Centennial Exposition at St. Louis, and in other connections he had identified himself prominently with the public life of that city, and with its business.

**FRANCIS JOSEPH**. Emperor of Austria and King of Hungary, one of the most important figures in European politics for 67 years, died at the royal palace of Schönbrunn, in the outskirts of Vienna, Nov. 21, 1916. Up to within a few hours of his death he insisted on supervising state affairs, through his customary audience with the Prime Minister (von Koerber). Francis Joseph's reign was the longest in modern history, exceeding that of Queen Victoria by four and a half years. Louis XIV, though nominally king for 72 years, actually ruled for little more than 60.

It is interesting to compare and contrast the lives and reigns of those contemporaries, Victoria and Francis Joseph. Each sovereign was greatly beloved, in a peculiarly patriarchal way. But the Queen's one great personal sorrow was the loss of her consort, while the Emperor lived through an extraordinary series of family tragedies. His brother, who became Emperor Maximilian of Mexico at the behest of Louis Napoleon and against the advice of Francis Joseph, was executed at Queretaro, in the land he had gone to rule. His only son, Crown Prince Rudolph, met a violent death at his hunting lodge at Meyerling, and the mystery surrounding his end involved a scandal. His wife, the Empress Elizabeth, whom he had married in 1855, was the youngest daughter of Duke Maximilian of Bavaria. She was a benevolent, gracious, and unpretentious woman, who, though reconciled to her husband after an estrangement resulting from his manner of life, shunned the ceremonial of the Viennese court. In 1898 she was assassinated by an anarchist at Geneva, Switzerland. A favorite niece of the Emperor's was burned to death in the palace of Schönbrunn, and the Duchesse d'Alençon, a sister-in-law of whom he was fond, was a victim of the Charity Bazaar fire in Paris. Another sister-in-law, Maximilian's wife, went mad after her husband's death. As a climax to the tale of horrors, the heir to the throne, the Archduke Francis Ferdinand, nephew of the Emperor, was murdered with his wife at Serajevo, Bosnia, in July, 1914, a tragedy that precipitated the War of the Nations,

in the midst of which the aged monarch died. If to all these distressing events be added the dangerous wound received by Francis Joseph himself in 1853 when a fanatic Hungarian tried to kill him, and the death as an infant of one of his three daughters, it will not seem strange that many believe they have seen executed the vengeance years ago called down on the Emperor by the Countess Karolyi, whose son had been victimized for his connection with the Hungarian War of Liberation: "May heaven and hell blast your happiness! May your family be exterminated! May you be smitten in the persons of those you love best! May your children be brought to ruin and may your life be wrecked, and yet may you live on in lonely, unbroken, and horrible grief to tremble when you recall the name of Karolyi."

Public calamity and private distress were mingled in Francis Joseph's life. Again in contrast to Queen Victoria, he entered wars that resulted in national humiliation and loss, instead of in increased imperial prestige. The Empire, instead of becoming welded together, seemed to be ever on the point of falling to pieces, held together only by the almost universal regard for the emperor. Despite the more liberal policy pursued after disastrous conflicts with France, Italy, and Germany had rendered imperative concessions that would placate discontent at home, one or another of the diverse elements of the national life was always in a state of rebellion, open or smothered. Francis Joseph grew to understand his people, or peoples, and they grew to understand him. He became an astute ruler and statesman, but he made costly mistakes, among which his last, the ultimatum to Serbia, is likely to be regarded as the most colossal.

Born Aug. 18, 1830, at Laxenburg Castle, near Vienna, Francis Joseph had in the Archduchess Sophia a severe mother whose chief interest was the Church. His father, Archduke Francis Charles, was a younger son of Emperor Francis I. As a boy he learned to speak the languages of the 17 different nationalities under Austrian rule. When he ascended the throne, at the age of 18, after his uncle, Emperor Ferdinand, had abdicated in his favor, he had been under the tutelage of the famous Metternich, and for years all his public acts reflected that imperialistic statesman's ideas. The young ruler was crowned in the midst of a national crisis. Revolts had forced Ferdinand to abdicate and Metternich to flee. Then Francis Charles waived his claims, and Francis Joseph was emperor. He had already fought in Italy under Field Marshal Radetzky—Italy, which was destined to be a kind of Nemesis for Austria. Altogether, at one time and another, the Hapsburgs lost Venetia, Lombardy, Parma, Modena, Tuscany, and Naples. After a hard-won victory over revolting Italian provinces in the very first year of his reign, the Emperor had to direct his attention to Hungary, where the formidable revolution headed by Louis Kossuth was only put down by Russian aid. As punishment, Hungary was absorbed into the Empire, deprived of constitutional liberties, and subjected to cruel retaliatory measures. It was not till 1867, when Francis Joseph and Elizabeth were crowned King and Queen of Hungary at Budapest, that a formal reconciliation took place. Afterward the Hungarians showed remarkable

personal loyalty to their ruler. In 1854 Austria refused to support Russia in the Crimean War; vengeance for this desertion came in 1866 when, in the Seven Weeks' War, which cost Austria her place in the German Confederation and control over several German duchies, Russia gave encouragement to Bismarck and Prussia. Only two years before, Bismarck had forced Austria into war against Denmark over Schleswig-Holstein, and a few years earlier (1859), Napoleon III had deliberately provoked a war with Austria to aid Mazzini in liberating northern Italian states from Hapsburg domination. Although Francis Joseph came out of this series of wars depleted in possessions, he had gained a kind of prestige through endurance. Moreover, he refused to side with France against Germany in 1870. Therefore, in 1878, at the Congress of Berlin, Bismarck saw to it that Bosnia and Herzegovina were turned over to the military protection of Austria; and when, in 1908, largely through the insistence of the Archduke Francis Ferdinand, Austria boldly annexed these countries, Germany stood beside her to meet the protests of the Entente. After the outbreak of the great war, the Triple Alliance resolved itself into a Dual Alliance, for Italy, refusing to be held by a merely formal bond, ranged herself with the Entente.

It would seem to be an evidence of the remarkable vitality of Francis Joseph that the strain of the European war did not tell on him sooner, especially as he became involved in a controversy with the Emperor William over military policies and peace negotiations. It was announced in January, 1915, that he was about to abdicate. Later it was decided that the Archduke Charles Francis Joseph, his grandnephew and heir (now Charles I, q.v.) would become co-regent in December, 1916. In his old age, two daughters were left to the Emperor—Gisela, married to Prince Leopold of Bavaria, and Marie Valerie, called the "Child of Peace" and her parents' favorite, the wife of the Archduke Francis Salvator.

Up to the end, Francis Joseph tried to perform the public obligations that were attendant on the prosecution of the great war. While reviewing troops in July, 1916, he caught a chill, and to this is traced the lung trouble which became acute four months later and resulted fatally. After his death, the Emperor's body, clad in the uniform of a Field Marshal, lay in state in the Hofburg Chapel for several days. On November 30th, it was transferred with impressive ceremony to St. Stephen's Cathedral, where the new Emperor and Empress, the Kings of Bulgaria, Bavaria, Württemberg, and Saxony, a hundred other members of royalty, five cardinals, and ten bishops participated in the funeral services. It was reported that the Emperor William was prevented by throat trouble from being present. The body of Francis Joseph was interred in the crypt of the church of the Capuchin monks. See AUSTRIA-HUNGARY; WAR OF THE NATIONS.

**FRANK, LEO M.** See GEORGIA.

**FRATERNAL INSURANCE.** See INSURANCE.

**FRAZIER, LYNN J.** Elected Republican Governor of North Dakota, Nov. 7, 1916.

**FREE BAPTISTS.** See BAPTISTS, FREE.

**FREE ART GALLERY.** See UNITED STATES NATIONAL MUSEUM.

**FREIGHT CONGESTION.** See RAILWAYS.  
**FRELINGHUYSEN, JOSEPH SHERMAN.** Elected Republican United States Senator from New Jersey, Nov. 7, 1916.

**FRENCH ACADEMY.** See ACADEMY, FRENCH.

**FRENCH CONGO.** The former name of French Equatorial Africa (q. v.).

**FRENCH EQUATORIAL AFRICA** (formerly French Congo). A French possession in equatorial Africa, on the west coast, between the German Kamerun and the Belgian Congo; composed of the Gabun Colony (capital, Libreville), the Middle Congo Colony (Brazzaville), and the Ubangi-Shari-Chad Colony (Bangui). From the old area of 669,280 square miles must be deducted, roughly, 170,270 square miles ceded under the convention of Nov. 14, 1911, to Germany by France; and to it must be added about 6450 square miles ceded to France by Germany from the Kamerun. The area ceded to Germany carries a population of about 1,000,000 out of the original 10,000,000 (the estimated population in 1906). These estimates of population are probably much too high. French acquisition began on the Gabun River in 1841. The products and exports are rubber, ivory, timber, palm kernels and oil, cacao, etc. Gold, copper, and iron are mined. Imports (1913), 21,181,678 francs; exports, 36,665,037 (11,119,319 and 17,453,933 in 1909). Expenditure of France for 1914, 10,420,505 francs. General budget, 7,000,000 francs; loan fund, 4,329,917. The country is unhealthy, and sleeping sickness has made great inroads on the native population.

**FRENCH ESTABLISHMENTS IN OCEANIA.** A French colony in the South Pacific, consisting of widely scattered groups and single islands. The most important island is Tahiti. Area (estimated), 3998 square kilometers; population, 31,477. Capital, Papeete (3617 inhabitants), in Tahiti. Imports and exports (1913), 9,030,474 and 11,554,507 francs respectively. The coast land of Tahiti is fertile and grows tropical fruits and vegetables.

**FRENCH GUIANA (CAYENNE).** A French colony and penal settlement on the northern coast of South America, acquired in 1626. The area is 88,240 square kilometers (34,069 square miles); population in 1911, about 49,000. Cayenne, the chief town and only seaport, has about 13,500 inhabitants. Gold-mining (placer) is the chief occupation of the people. Imports and exports in 1913 were valued at 12,494,765 and 12,222,537 francs respectively. Of the value of the exports, about five-sixths is gold. The penal population included, Dec. 31, 1914, 4478 transported and 13 undergoing reclusion; 3003 *relegués* and 1199 freed.

**FRENCH GUINEA.** A French West African colony lying on the coast between Portuguese Guinea and Sierra Leone (British). Capital, Konakry, with 6623 inhabitants; Kankan is the chief commercial centre. There is a railway from Konakry to Kouroussa (588 kilometers). A branch to Kankan was completed in 1914. Rubber is the principal export, and is gathered over all the colony; but the principal sources are the Futa-Jallon, the Farana region, and certain circles of Upper Guinea. Rice is grown, and grazing is widely practiced. In 1914 there were in the colony 400,000 cattle, 150,000 sheep, 140,000 goats, and 3000 horses.

The budget for 1916 balanced at 6,827,400 francs. See FRENCH WEST AFRICA.

**FRENCH INDIA.** Five French dependencies in India, covering 513 square kilometers, with 273,530 inhabitants in 1914 as compared with 282,472 in 1911. The towns are Pondicherry (the capital), Karikal, Mahé, Chandernagor, and Yanam. The imports and exports (1914) were valued at 7,545,629 and 34,303,511 francs respectively. The chief exports are oil seeds, raw cotton, and pulse. Railway from Pondicherry to Villapuram and Peralam to Karakal, 30 kilometers. The local budget balanced for 1915 at 2,006,000 rupees; expenditure of France for 1915 was 1,230,000 francs. The debt stood Jan. 1, 1914, at 470,400 francs.

**FRENCH INDO-CHINA.** A French dependency in southeastern Asia, made up of five states and a strip of territory leased from China, as follows:

	Sq. kms.	Pop. 1911	Pop. 1906
Annam	159,890	5,542,822	5,518,681
Cambodia	175,450	1,487,948	1,193,534
Cochin-China	58,985	3,050,785	2,870,514
Laos	290,000	681,839	5,896,510
Tongking	119,750	6,117,954	668,727
Kwangchow-Wan*	1,000	158,881	177,097
Total	†808,055	16,990,229	16,315,063

\* Leased territory. † Square miles.

The country is under a governor-general, each state having a resident-general excepting Cochin-China which, being a colony, has a governor.

Hanoi (in Tongking) is the capital, with (1911) 113,676 inhabitants; Cholon had 191,665; Bin-Dinh, 75,000; Saigon, 72,000.

There are coal, lignite, and zinc mines. The chief product for export is rice (1,295,473 tons in 1914). Trade statistics are returned for the colony as a whole; in 1913 the imports were valued at 306,238,068 francs, and the exports at 345,259,253 francs. A British survey gives for 1914 £8,124,928 imports and £11,110,099 exports. The general budget balanced for 1914 at 35,585,300 piastres. Debt (Jan. 1, 1913), 345,913,000 francs. There is a military force of (1914) 10,861 European and 13,968 native troops.

**FRENCH LITERATURE.** Very little was published that was not directly or indirectly connected with the war. But the output of war books, which have, or claim to have, literary value, is enormous, and selection of such as ought to be recorded here is very difficult. Again, while the quality is often really quite high, nothing of supreme excellence could be named, *Gaspard* remains the book of the war. To the Prix Goncourt which was awarded to it at the end of 1915, the Academy has added the Grand Prix de Littérature in 1916.

**DRAMA.** Here the crop is meagre. *Plus haut que l'amour*, the first play of the novelist A. Couvreur, is a bewildering and sensational war play. H. Bataille's *Amazonne* has still to prove its success; it is the painful story of a girl of the invaded provinces, who, having seen her whole family slaughtered, gets into a state of patriotic frenzy which in the *milieu* where she has taken refuge (in Tours) proves to be contagious; and all sorts of harm come out of it. It may be deep psychologically, but this seems not to be the sort of literature people want. The play may fare as did Soulié's *1914 à 1937*, the story of a boy, an *enfant du crime* of a French woman of the invaded provinces, who

later, in 1937, finds his father, a German soldier of the great war, and strangles him: it did not please. Two decided hits were made, one by Wolff's exquisite short *Les deux gloires* and the other by *Le Poilu*, by Hennequin and Veber, music by Jacquet, a graceful vaudeville: a young soldier falls in love with his "marraine" just from reading the letters she sends to the trenches; complications arise, but all ends well. This gives the tone of the theatre: people want relaxation, and the managers have decided to offer this rather than the great patriotic plays of last winter. Nobody expects such plays as *Puces à l'oreille*, *Coralies et Cit*, *Tante d'Honfleur*, *Dindons*, etc. to live long. "Reprises" were organized of *Boubouroche*, *Poil de Carotte*; of a few patriotic plays as *Pour le Glaive*, *L'Espionne*, *La Tour de Nesle*; of Zola's *L'Assomoir*, evidently in connection with the idea of the French government to enforce prohibition of alcohol, except wine and beer; and of *Le Père Lebonnard* which vindicates the "bourgeois" so much attacked before the war. After the war an effort will be made to revive the *théâtre populaire*, where people in the provinces will act, as amateurs, plays of a moral and patriotic nature (such as Pottecher had established in Bussang); F. Brunot, the celebrated professor of the Sorbonne and the Mayor of the Eighteenth Arrondissement in Paris, has already written such a play, *La Défense de Schirmeck*, patriotic tableaux in reconquered Alsace (five acts). A good deal of attention has been paid to the theatres in the trenches (see Lortel, in *Revue intern. de Sociologie*, November, 1915). Among these plays we may mention *211 Revue*, by Dr. Voivenel, and *André Bataille, Plaies et . . . Boches*, full of vim. Boyer went to the front with his *roulotte*, or movable theatre which he used to take about from Montmartre to the Latin Quarter. Albert Carré, the Director of the Théâtre Français, wishing to remain at the front, has been replaced temporarily by E. Fabre. Mounet-Sully (q.v.), the venerable *doyen* of the Théâtre Française, died. Sarah Bernhardt and Yvette Guilbert appeared in American theatres. The Théâtre Français in New York, under the direction of Lucien Bonheur, has offered some good acting in a repertoire not always tactfully chosen.

**POETRY.** The present epic period inspires many poets. A few conspicuous collections are: Paul Fort, *Poèmes de la France*, *Bulletin lyrique des armées*; the author of *Ballades Françaises* handles the *vers libre* with as much subtlety and mastery as ever. H. Bataille, *La Divine Tragédie*; like Dante's *Divine Comedy*, it starts with the infernal realities (of the European war) to end, in the following volumes, with the song of victory. (This is the collection which contains the striking poem *Le Nouveau Christ*.) Paul Claudel's *Autres poèmes de guerre*; Francis Jammes, *Cinq prières pour temps de guerre*; Verhaeren, *Les ailes rouges de la guerre*; Zamaçois, *L'Ineffaçable, poèmes de guerre*—such names guarantee the quality of the poetry. Then a few single poems have attracted attention: Verhaeren, "A la Belgique, Contre l'Allemagne exterminatrice de Races" (*Revue Hebdomadaire*); F. Francis Porché, "L'Arrêt de la Marne, à la Mémoire de Ch. Péguy" (*Figaro*); Julien Vocance, "Cent visions de guerre" (*Grand Revue*); the Académie des Jeux floraux de Toulouse has awarded the Violette d'Or to G.

Champenois' "A la Gloire de l'Armée Française." The following all deserve a mention: H. Ghéon, *Foi en la France*; M. Pottecher, *Chants de la Tourmente*; Pierre Mille, *En croupe de Bellone*; G. Mourey, *Chant du Renouveau*; J. H. d'Artigues, *Heures de pourpres et d'ombres*; Gilles Normand, *Voix dans la Fournaise*; J. d'Estrain, *Les tristesses et les gloires*; N. Baudoin, *L'Offensive héroïque*; Spiers, *Et j'ai voulu la paix*; Allou, *Strophes d'Acier*; Roudrié, *La légende du poilu*; Banneret, *Cantique des morts*; B. de Roux, *Sonnets de Victoire*; L. Franc, *Chants devant les Barbares*; Figuières, *Clochers démolis*; Hauser, *La France sauvée*; Guerville, *Les Glorieux*; Trouillot, *Gavroche et Flambeau*; Trochu, *Poèmes de guerre*; Maréchal, *Vision de guerre*; Captain Mermet, *Une foi! Des amours, du sang*; Général Bruneau, *Voix dans l'ombre*. For Botrel, *Chansons de route* (53 songs, 34 with music, 112 drawings), see YEAR BOOK, 1915.

NOVELS. The posthumous *Centurion* by E. Psichari was published in the *Illustration* of Christmas last year with a noteworthy introduction by Bourget; it is a psychological autobiography of the young officer, very catholic in spirit. A real war-novel is M. Prévost's *Adjudant Benoit*; in Lorraine, Benoit finds that the father of his fiancée is a traitor to the French cause and he kills him, but leaving the girl in ignorance of the infamy; she herself is killed later by a shell. Paul Marguerite writes on *L'Embussqué*, a soldier who dodges his duty as a soldier and hides with a woman in Paris. Avèze tells the story of a spy, *Martha Steiner*, a governess who puts out the eyes of the father and has the boy entrusted to her killed. E. Mosely, in *Le Journal de Gottfried Mauser*, gives vent to anger at having been betrayed by trust in an unworthy nation. G. Leroux, in *Le château noir*, depicts in the weirdest manner the horrors of the war as conducted by barbarians; while F. de la Guérinière describes *La Kultur déchainée*. F. de Nion, in *Son sang pour l'Alsace*, writes about the conflicting duties which confront the Alsatian families that had partly adopted the German régime. Jean Corail, in *Les Centurions* continues the series of novels begun long before the war of the officers of the French colonies. Two volumes of stories of the trenches, *Nouveaux contes des tranchées*, and *Sous l'obus*, both by un "groupe de Poilus." The humorist G. de la Fouchardière writes an amusing book on *L'Araignée du Kaiser*. The two novels by Félicien Champsaur, *Mets en 1870*, and *Le Bandeau*, are disconcerting; the author seems to vindicate the German army and exonerate it for the "atrocities" which were held against it. One knows the part played in the war by aviators; two quite remarkable novels deal with this topic. J. H. Rosny, *Perdus!*, and P. Acker, *L'oiseau vainqueur*. Driant (Captain Danrit) reminds one of Jules Verne, in his *La guerre souterraine*. Three interesting products have children as heroes: F. Boutet, *Victor et ses amis*, trying to help in all sorts of ways the soldiers; A. Machaud, *La guerre des mômes*; A. Hermant, *L'autre aventure du joyeux garçon*, a young Englishman who comes to France before the war and dies during the war. Charles H. Hirsch has two novels, *Chacun son devoir*, a realistic and altogether unpleasant story of a one-eyed man who finally finds his usefulness during the war

in marrying the wife of a soldier killed in the trenches, and taking care of the family; *Mariée en 1914*, telling of the duty of the mothers to warn their children soon to be born against the hypocritical sentimentality of the Germans; they must not be deceived again. V. Goedorp, *Madame Crésus infirmière*, describes a miserable character redeemed through the war, but by the influence of a woman. Gyp, in her witty vein, has also her lesson to offer; in *Ceux de la Nuque* (by which she means those of the rear) she denounces the wealthy, especially women who live as if war were not spreading misery all over the world. Colette Yver takes up the same general idea in *Mystères des Béatitudes*, telling how the poor, in these days of great trial, find a vastly greater blessing in their humble but lofty duty than those who try to enjoy life in the worldly manner.

Some of the best writers have tried to take off the minds of the readers from the horrors of the war. Fr. Jammes's *Rosaire au soleil* is a touching story of a girl finding in religion her way of living a higher life; Gérard d'Houville, in *Jeune fille*, offers a delightful picture of a girl; and Madame Colette to get away from brutal humanity delights her readers by her account of *La paix chez les bêtes*. C. Roubeau, in *Morale Grise*, and H. Ardel, in *La chemin qui descend*, give very depressing novels which seem quite out of date. F. Maël's *L'île qui parle* is a novel of adventure. Others deserving mention are: Le Frapié, *Le capitaine Dupont*, five short stories; Avesnes, *La vocation* (Grand prix du Roman, 1916), a plea for more practical tests for the admission of students to the Naval Academy in France. The Académie Goncourt has awarded its 1914 prize to *Le Feu* by Barbusse, and of 1915 to *Appel du Sol* by A. Bertrand.

WAR PROSE. (A.) Of the philosophers of the war we endeavor to mention only the best: the following are mostly articles, now collected in book form: Verhaeren answers Romain Rolland's *Audessus de la Mêlée*, in the *Grande Revue*: "One must not take a scale in hands, when the enemy brandishes a sword." Jean Aicard, *Des cris dans la mêlée*; Jean Richepin, *Proses de guerre*; Paul Adam, *Dans l'air qui tremble*; Maeterlinck, *Débris de guerre*; Abbé Wetterlé, *Propos de guerre*; Ch. Maurras, *La France se sauve elle-même*; Michel Provins, *Ceux d'hier et ceux d'aujourd'hui*; P. Hamp, *Victoire de la France sur les Français*; Suard's *La nation et la race*; and Barre's *Amitié des tranchées*. Let us add here, Léon Daudet's *L'Hérédité, essai sur le drame intérieur*, a discussion of heredity, determinism, and other "scientific" theories, to which he opposes a gospel of moral energy, "la vie plus forte que la mort"; and A. Séché, *L'Oreille sur le cœur*, feeling the pulse of the present generation.

(B.) The following are actors of the war. The number of those who handle the sword and the pen equally well is remarkably great. The most famous book is *Lettres d'un soldat à sa mère*, prefaced by Chevillon, and which has been translated and widely read in America, telling how a man has been morally transformed by the war. Ch. Mallet, *Estampes et combats*; General Malleterre, *De la Marne à l'Yser, la victoire des forces morales* (died since); Captain Z., *L'armée de la guerre* (very striking); General Malleterre, *De la Marne à l'Yser, la*

ligne; Henry Bordeaux, *Derniers jours du Fort de Vaux*; P. Lintier, *Avec une batterie de 75, Ma pièce*; R. Benjamin (author of *Gaspard*), *La guerre sous le ciel de France*; Captain Redier, *Méditations dans les tranchées*; Abbé Wetterlé, *Têtes de Boches*; Abbé Klein, *Les douleurs qui espèrent*; M. Dupont, *En campagne*; Lieutenant R. Deville, *Carnet de route d'un artilleur*; René Milan, *Vagabonds de la gloire*; he served as a sailor, and tells of his experiences until Salonica; Jean Variot (the author of *Hazard de la guerre*), *La crois des Carmes*, episodes of the war in Lorraine; M. Genevois, *Sous Verdun*; Roujon, *Carnets de Route*; J. Léry, *La bataille de la Forêt*, in Argonne; J. Renaud, *La tranchée rouge*. Then several volumes telling of the authors' experiences as prisoners of war in Germany: G. Riou (the author of *Aux écouttes de la France qui vient*), *Journal d'un simple soldat*; Abbé P. Aubry, *Ma captivité en Allemagne*; Ch. Hennebois, *Aux mains de l'Allemagne*—all three, very striking accounts. A book by itself is Hugues Le Roux, *Au champ d'honneur*, a diary about his son, killed in action. Finally we must mention the newspapers in the trenches; there are many; see a list in *Publications de la guerre*, Paris, 1916, and descriptions of some in *Grande Revue*, article by Bompard; or in the *Century Magazine*, October, 1916, by Gellert Burgess.

**HISTORY OF LITERATURE AND CRITICISM.** Even here the war influence is strongly felt. E. L. Kerdaniel, *Un soldat poète du XV<sup>m</sup> siècle*, *Meschinot*; A. Lefranc, *Un réformateur militaire au XVI<sup>m</sup> siècle*, *Raymond de Fourquevaux*. Then: A. Dorchain, *Etudes sur Pierre Corneille*; Joseph Dedieu, *Montesquieu*; P. M. Masson, two books on the religious ideas of Rousseau; Pierre Kohler, *Madame de Staël et la Suisse*; E. Faguet, *Mgr. Dupanloup*; Barthou, *Lamartine orateur*. About contemporaries: V. Bourdon, *Avec Ch. Péguy, de la Lorraine à la Marne*; H. Massis, *La vie d'E. Psichari*. *Anthologie des écrivains morts pour la patrie*, preface by Barrès. An anonymous satire against M. Barrès, *Le jardin de Marrès, par Bérénice*—about the speaking and abundant writing of Barrès as contrasted with the action of the men at the front. H. Brémont publishes an *Histoire du sentiment religieux en France depuis la fin des guerres religieuses jusqu' à nos jours*, and R. Valléry-Radot an *Anthologie de la poésie catholique de Villon à nos jours*, with a preface by Claudel, saying: "Who would suspect, in reading Rabelais, Montaigne, Racine, Molière, Victor Hugo, that a God died for us on the cross. This must stop." A. Mary offers an interesting collection of *Maximes des grands capitaines français*. Larousse publishes a *Dictionnaire des termes militaires et de l'argot poilu*; and Sainéan, *L'argot des tranchées*.

**LITERARY EVENTS.** R. Benjamin was awarded the Grand Prix de Littérature. Le Goffic, author of *Diemude*, and of *Bourguignottes et Pompons rouges*, the Prix Lasserre.—The dead of the year are: Ch. Poimarols, the Christian poet; F. Charmes (q.v.) of the French Academy, and editor of the *Revue des Deux Mondes* (where he was replaced by Doumic); A. Filon, the critic; E. Faguet, Marquis de Ségur, and Marquis de Vogtli (qq.v.) all three of the Academy; Emile Verhaeren (q.v.), killed while boarding a train at Rouen. Dead on the field of honor: Lieutenant-Colonel Driant (Danrit);

E. Clermont, author of *Laure*; E. Bourcier; Henri Bachelin; E. Henriot; R. Vincent; E. Nolent; L. Boyer; P. M. Masson; the following poets: E. Despax, L. Rolmer, J. Gravier, Ch. Crécy, A. Dumange, L. Gignoux.

**FRENCH PHILOLOGY.** See PHILOLOGY, MODERN.

**FRENCH SOMALI COAST.** A French protectorate on the Gulf of Aden, lying between Eritrea and British Somaliland. Official report gives area 120,000 square kilometers, and population (1911) 213,000. Jibuti, the capital, has about 17,000 inhabitants. Imports (1914), 28,692,145 francs (chiefly cotton goods, butter, sugar, galvanized iron); exports, 43,643,215 (chiefly coffee, ivory, hides and skins). The local budget for 1915 balanced at 2,150,000 francs. The trade with Abyssinia, which formerly passed through Zaila, now goes through Jibuti by rail to Diré Dawa.

**FRENCH WEST AFRICA.** A French government-general with headquarters at Dakar (since 1902), created by the decree of June 16, 1895; M. Chautemps being the colonial minister. By the decree of Oct. 29, 1904, French West Africa was defined as including five colonies, the Niger territory being comprehended in the colony of Upper Senegal and Niger, and the civil territory of Mauritania. By the decree of Sept. 7, 1911, to take effect Jan. 1, 1912, the Niger territory was separated from Upper Senegal and Niger colony and became an administrative subdivision known as the Military Territory of the Niger, under a commandant. Estimated area and population as follows:

	Sq. km.	Pop.
Senegal .....	191,600	1,247,096
French Guinea .....	239,000	1,927,000
Ivory Coast .....	325,200	1,265,000
Dahomey .....	107,000	902,000
Upper Senegal and Niger....	782,700	6,085,000
Mil. Ter. of the Niger .....	1,883,700	
Mauritania .....	898,700	250,000
Total .....	* 3,922,000	11,626,000

\* 1,514,632 square miles.

St. Louis (Senegal) has 23,300 inhabitants, Dakar (the government headquarters), 23,833; Konakry is the capital of French Guinea, Bingerville of the Ivory Coast, Porto Novo of Dahomey, Bamako of Upper Senegal and Niger.

The total value of all imports for 1913 was 151,574,000 francs; of this total, imports valued at 66,547,000 francs came from France. Total exports, 126,144,000 francs; of which, exports valued at 66,349,000 francs were received by France. The total debt stood Jan. 1, 1912, at 156,277,336 francs. The French budget for 1914 estimates an expenditure for French West Africa of 24,522,030 francs, largely for military purposes. General colonial budget 1916, 24,360,000 francs. A force of 13,500 men is maintained, of whom 1500 are Europeans.

**FREUD, SIGMUND.** See PSYCHOLOGY, *Psychotherapy*.

**FRIENDS, RELIGIOUS SOCIETY OF.** There are four branches of this denomination: the Orthodox, Liberal (Hicksite), Wilburite, and Primitive. The Orthodox body is the most numerous. It has, according to the latest statistics (1915) 97,876 members, 1315 ministers, and 775 meeting houses. The Hicksite or Liberal branch has 18,381 members, 99 ministers,

and 211 meeting houses; the Wilburite branch, about 3880 members, 47 ministers, and 48 meeting houses; the Primitive, about 171 members, 10 ministers, and 8 meeting-houses. The Five Years' Meeting is the central organization of the Orthodox body. It includes 13 yearly meetings. The Friends' General Conference includes the seven yearly meetings of the Hicksite body. Both have shown considerable activity in recent years. Summer schools are held and Woolman House, a Friends' School for Social and Religious Education was established at Swarthmore, Pa., in 1915. All branches of Friends are uniting in the propaganda of their peace principles.

**FRUG, SIMON.** See JEWS AND JUDAISM, *Literary Events*.

**FRUIT PRODUCTION.** See HORTICULTURE.

**FUEL.** See BOILERS; CHEMISTRY, INDUSTRIAL; COAL; PETROLEUM.

**FUR-BEARING ANIMALS.** See ALASKA.

**FUTURISM.** See ITALIAN LITERATURE; PAINTING AND SCULPTURE.

**GALICIA.** An Austrian crownland, bounded by Russian Poland on the north and Russia on the northeast and east, and on the southwest separated by the Carpathian Mountains from Hungary. Galicia formed a part of Poland from the fourteenth century until 1772, the year of the first Polish partition. Galicia is by far the largest of the Austrian crownlands, covering an area of 30,308 square miles, which is slightly smaller than the State of South Carolina. Population at the census of Dec. 31, 1910, 8,025,675, compared with 7,315,939 in 1900. The natural increase in the decade was 1,198,279 and the net emigration 488,543. Of the inhabitants in 1910, 7,112,574 (88.61 per cent) were returned as Catholics (including those of the Roman, Greek, and Armenian rites); Jews, 871,895 (10.86 per cent); Evangelicals, 37,144 (0.46); adherents of the Orthodox Church, 2845 (0.05). The number of Austrian subjects in 1910 was 7,980,477; Polish was the vernacular of 4,672,500 (58.55 per cent) of these; Ruthenian, 3,208,092 (40.20); German, 90,144 (1.13). About 93 per cent of the Austrian Poles and 91 per cent of the Austrian Ruthenians are inhabitants of Galicia. Of the population in 1910, those dependent on agriculture constituted about 73.0 per cent; industry and the trades, 9.5 per cent; commerce and transportation, 9.6 per cent; public and military service, 7.9 per cent. The capital of Galicia is Lemberg, the seat of one of the eight Austrian universities; its population at the 1910 census was 206,113. The other larger towns are: Cracow, 154,141; Przemyśl, 54,078; Kolomea, 42,676; Tarnów, 36,731; Drohobycz, 34,665; Tarnopol, 33,871; Stanislaw, 33,328; Stryj, 30,895; Neusandez, 25,004; Jaroslau, 23,965; Rzeszów, 23,688; Podgórze, 22,322; Knihinin Wies, 22,143; Sambor, 20,257; Brody, 18,055; Boryslaw, 15,145; Buczacz, 14,286. See WAR OF THE NATIONS.

**GALLI-CURCI, AMELITA.** See MUSIC, *Opera*.

**GALLIENI, JOSEPH SIMON.** A French general, died at the military hospital at Versailles, May 27, 1916. He was born at St. B at April 24, 1849, graduated in 1868 from the military academy of St. Cyr, and as a lieutenant fought in the Franco-Prussian War. With Commandant Lambert, he was one of the small group of men who met the Bavarians and opposed them heroically at a house since called

"La derni re cartouche" ("The Last Cartridge"), from a famous painting made by Alphonse de Neuville. By 1878 Gallieni had become captain, and two years later he was sent to reestablish relations between France and Ahmadou, Sultan of Segou. Although threatened with death constantly during a captivity of eight months, he kept at his task and finally gained a grant for his country of exclusive commercial privileges with the Upper Niger. This feat brought him a lieutenant-colonelcy and his explorations earned him the gold medal of the Geographical Society. Later he was stationed at Brest, and next was ordered to Tongking. His promotion to general was the reward for his services in commanding and pacifying the second military territory of Indo-China. In 1896 the colony of Madagascar had just been acquired by France; Gallieni, recognized as its conqueror, was commissioned to remain there as governor-general, to depose Queen Ranavalao and restore order. His tenure of office, lasting until 1905, was marked by a notable piece of constructive work. He put down several revolts, and gained wide recognition for his success in handling the natives. Subsequently he served on various stations, as an inspector of troops, as commander of the thirteenth army corps, as military governor of Lyons, etc. By 1908 he had become a member of the Superior War Council.

However, General Gallieni will be best remembered for his part in the European war. On Aug. 27, 1914, when the German General von Kluck's great drive menaced Paris, Gallieni was appointed military governor of the city. He announced, "I have received the mission of defending Paris against the invader. I shall accomplish that mission to the end." It has been stated that General Joffre foresaw that the Germans, on approaching the French capital, would attempt to encircle the city; that therefore a chance would be afforded for a picked body of men to sally out and cut the lines of communication in such a way as to capture von Kluck. Before the time for this move came, however, General Manoury sent in word that he was hard pressed in his position north of Paris, and Gallieni rushed the reserved troops to his relief. This led, eventually, to the check which ended by the Germans being pressed back to the Marne, so that Gallieni has been credited with his rightful share in the victory—in fact, he gained the name "savior of Paris." He had made of the city an armed camp, and in the most effective way provided for its defense. For 14 months he remained at his post of governor, at the end of that time entering the reorganized French cabinet as Minister of War. Here, also, he made a notable record for efficiency, brushing aside red tape, and bringing the personnel of officers to a high point. In February, 1916, he added to his other duties supervision of the Department of Aviation, but the next month ill health forced his retirement. He was accorded an impressive military funeral.

**GALLY, MERRITT.** An American inventor, died March 7, 1916, in Brooklyn, N. Y. Born in 1838 at Perry, N. Y., and educated at the University of Rochester (A.B., 1863) and at Auburn Theological Seminary, he was for several years a Presbyterian minister. Throat trouble compelled him to give up this profession, and he turned to the perfecting of mechanical devices. Among his inventions were the Uni-

versal job press for artistic printing (1860), a linotype machine, patents for which were sold in 1872, a multiple telegraph system, and mechanism for telephone relays and repeaters. Altogether, he had taken out several hundred patents.

**GALSWORTHY, JOHN.** See DRAMA.

**GAMBIA.** A British West African colony on the river Gambia (area, 69 square miles), with a protectorate extending on both banks of the river for 250 miles from its mouth (about 4000 square miles). Capital, Bathurst. Population of St. Mary's Island, on which Bathurst is situated, 8807; of the protected districts, 152,000. The cultivation of peanuts is the principal industry. Imports (1914), £688,007; exports (1914), £926,127 (peanuts, 66,885 tons, valued at £650,461).

#### **GARBAGE AND REFUSE DISPOSAL.**

War conditions materially increased the revenue from garbage-reduction works during the year, owing to high prices for grease and for fertilizer-base tankage. This of course encouraged reduction as a means of disposal. Where garbage was mixed with other refuse and burned, instead of being treated separately in reduction works, the recent tendency was away from the British type of high-temperature destructors—with forced draft and heat utilization for producing electric light and power—and toward simpler forms of incinerators—with relatively low temperatures and little or no attempt to utilize the heat of combustion. This tendency may be only temporary, though the chances seem to be the other way, especially for the smaller cities. Feeding garbage to hogs continues in a number of cities while in others, "sanitary fills" or the use of garbage in layers, covered with clean ashes or earth, are being made, thus getting rid of these city wastes and raising the level of low-lying land at the same time.

New York City let a five-year garbage-disposal contract early in 1916 which will yield it a total of \$900,000. For garbage from the boroughs of Manhattan, the Bronx, and Brooklyn delivered by the city at various points on the water-front the contractor agreed to transport the garbage by water to reduction works of the Cobwell type located in the Borough of Richmond. Here grease was to be extracted and fertilizer tankage recovered for sale. Strenuous opposition was made by Staten Islanders to the location in their borough of works to treat the garbage from three other boroughs on the ground of alleged nuisance and general unfairness. An appeal was made to the Governor of New York and referred by him to the State Department of Health for investigation and report. The matter was pending at the close of 1916. Meanwhile the garbage of the city was being disposed of at the old Barren Island reduction works under another contract similar in general terms but which yielded the city less money.

A questionnaire raised on methods of collection and on haulage to the point of final disposal sent out by B. F. Miller, City Engineer, Meadville, Pa., brought returns from 125 cities and towns. Summarized (*Engineering News*, Nov. 23, 1916), these returns indicated a growing sentiment in favor of municipal rather than the generally prevailing contract system of collection and also a growing tendency to put this service in charge of the public-works instead of the public-health department. Motor trucks

were used for collecting and hauling garbage and refuse in some cities, but a large majority use horse-drawn vehicles. The replies indicated that as a rule motor trucks were not considered advantageous for ordinary house-to-house collection but that where the houses are widely separated, and also for long haul from central collecting stations to the point of final disposal, motor trucks are often advisable. Motor trucks might also be advantageous for taking garbage and refuse away from hotels and restaurants—on account of the large quantities involved.

Recognizing that the garbage and refuse problem was one for engineers to study with careful attention to a variety of conditions peculiar to each city, engineers experienced in the subject were employed to make investigations of needs of Washington, D. C., and of two relatively small cities in Illinois, Danville and Galesburg. In each case particular attention was given to the collection service which, with haulage to the point of final disposal, often cost more than disposal. The Washington study was made by Irwin S. Osborn, Cleveland, Ohio, and the two Illinois studies by Samuel A. Greeley, Chicago, Ill.

**GARDENING.** See HORTICULTURE.

**GARDEN PRODUCE.** See HORTICULTURE.

**GARDNER, FREDERICK D.** Elected Democratic Governor of Missouri, Nov. 7, 1916.

**GARNETT, JAMES MERCER.** An American educator and scholar, died in Baltimore, Feb. 18, 1916. He was born at Aldie, Va., in 1840, and graduated A.M. from the University of Virginia in 1859. During the Civil War he served in the Confederate army, rising to be captain of artillery, and after study at Berlin and Leipzig, returned to be principal of St. John's College, Annapolis, Md. (1870-80). From 1882 to 1896 he held the chair of English in the University of Virginia, and afterward for many years taught privately. At various times he was vice-president of the Modern Language Association of America, and president of the American Dialect Society and the American Philological Association. His writings deal with Old English literature; he also edited standard English works, as well as *Selections in English Prose* (1891).

**GARRETT, JOHN W.** An American diplomat, whose appointment as United States Minister to the Netherlands, to succeed Dr. Henry van Dyke, resigned, was announced Dec. 4, 1916. A resident of Baltimore, Mr. Garrett had previously been Minister to Argentina and after the beginning of the European war he went to Paris on a special mission for the State Department.

**GARY PLAN.** See EDUCATION IN THE UNITED STATES.

**GAS, NATURAL.** The natural gas industry of the country is one of steadily increasing importance. In spite of the demands that have been made on the reserves during the last 50 years, and the depletion of the supply in many localities, especially in Pennsylvania, Ohio, and Indiana, the total volume of natural gas produced and commercially utilized in 1915 exceeded all previous records, aggregating 628,578,842,000 cubic feet. The total market value of the production was \$101,312,381. West Virginia in 1915 produced the largest quantity, 244,400,159 million cubic feet. Pennsylvania was second, Oklahoma third, Ohio fourth.

Other States producing large quantities were Kansas, California, Louisiana, and Texas.

**GAS ENGINES.** See INTERNAL COMBUSTION ENGINES.

**GASES, ASPHYXIATING.** See CHEMISTRY, INDUSTRIAL, *Asphyxiating Gases*.

**GAS-FILLED LAMP.** See ELECTRIC LIGHTING.

**GASOLINE.** See AUTOMOBILES; CHEMISTRY, INDUSTRIAL; PETROLEUM.

**GASPARD.** See FRENCH LITERATURE.

**GEBEL.** See ARCHÆOLOGY.

**GEMS AND PRECIOUS STONES.** The total production of gems and precious stones in the United States in 1915 was valued at \$170,431, compared with a value of \$124,651 in 1914. Precious stones having the most value in 1915 were the sapphire, followed by agates, chalcedony, onyx, turquoise, turmaline, and jasper. Montana ranks first among all the States in the value of precious stones, a position which it has held for five years. The output consists chiefly of sapphires, which constituted almost one-half of the total value of all precious stones produced in the United States in 1915. California ranks second, Nevada third, and Colorado fourth. Diamond mining was carried on in Arkansas during the year, and 31 stones were found. These were white, yellowish, and brown. Three of the stones weighed .32, 1.22, and 2.5 carats respectively. Isolated diamonds were also found in various parts of California. The imports of precious stones in the United States in 1915 amounted to \$26,193,862. The imports of unset diamonds in 1915 amounted to \$13,169,998.

**GENERAL EDUCATION BOARD.** See MODERN SCHOOL, THE; ROCKEFELLER PHILANTHROPIC BOARDS; UNIVERSITIES AND COLLEGES.

**GENETICS.** See ZOOLOGY, *Heredity*.

**GEOGRAPHICAL SOCIETY, AMERICAN.** A scientific society organized in 1852, with headquarters at Broadway and 156th Street, New York. During 1916 the society undertook to extend its activities along a number of different lines. It gave large support to the Crocker Land Expedition and inaugurated a series of special publications, of which one volume a year is to be issued. The first volume, entitled *The Andes of Southern Peru*, was published in December, 1916. In January, 1916, the *Bulletin* of the American Geographical Society was changed to the *Geographical Review*, a new magazine of broader scope and larger size, under the editorial management of Dr. Isaiah Bowman, Director of the Society. During 1916 about 30,000 persons attended the public exhibitions of the society, consisting of war maps and maps illustrating the economic geography of the world. The latest explorations were all shown on special maps directly after reports were received. By the end of 1916 the society had over 2500 fellows. The officers for 1916 were: President, John Greenough; vice-presidents, James B. Ford, Paul Tuckerman, Anton A. Raven; foreign corresponding secretary, Prof. William Libbey; domestic corresponding secretary, Archibald D. Russell; recording secretary, Hamilton Fish Kean; treasurer, Henry Parish, Jr.

**GEOGRAPHIC SOCIETY, NATIONAL.** The Society's work during the year included the publication of Dr. Hiram Bingham's survey of the results of the 1915 expedition to Peru and Prof. O. F. Cook's studies of the wonderful bo-

tanical aspects of the country, with other reports. The expedition unearthed a number of ancient highways, buried cities, and ruined temples, and showed that the region around Machu Picchu was perhaps the most densely populated country in the Western Hemisphere in pre-Columbian times.

The explorers found that the inhabitants, the Incas, made pottery resembling that of early Greece; performed surgical operations; and had wonderful staircase farms; that they laid stones weighing tons with the greatest nicety and domesticated some 80 species of plants, including potatoes and corn.

During 1916 Dr. Robert F. Griggs, whose expedition was financed by the Society, investigated Katmai Volcano and discovered the "Valley of the Ten Thousand Smokes." The whole of Vesuvius could almost be entombed in the crater of Katmai and the "Valley of the Ten Thousand Smokes" was found to be a geyser region surpassing even the Yellowstone.

In December the Society supplemented a Federal appropriation of \$50,000 by one of \$20,000 from its own treasury, to make up the \$70,000 necessary to acquire the privately owned sequoias in the Giant Forest of the Sequoia National Park, the first time that a national organization has thus cooperated with the Federal government to preserve the nation's scenic assets.

The membership of the Society, of which O. H. Tittman is president and Gilbert H. Grosvenor is Director and Editor, now exceeds 550,000, and is growing at the rate of 100,000 a year. The *National Geographic Magazine* is published monthly by the Society.

**GEOLOGY. GENERAL WORKS.** A review of the recent developments would be incomplete without making mention of works of popular character, like H. F. Osborn's *Man of the Old Stone Age* which gives an account of the available evidences bearing upon prehistoric man and his environment. It is a volume that will interest the more expert for its philosophic treatment and skillful analysis of the data. Its appearance is timely in view of the remarkable advance that has come about recently by reason of the discoveries of new material in England and on the continent of Europe, which have enabled anthropologists to bridge some of the gaps that previously existed in the line of man's ancestry. The author has arranged the stages of culture chronologically, placing values upon the intervals represented, but it should be noted that the arrangement is rather tentative and the time periods are to be freely interpreted.

A restatement of the planetesimal theory of Chamberlin under the title *The Origin of the Earth* aims to remove the difficulties in the way of a wider knowledge of the subject by curtailment of technical detail, and at the same time seeks to show the application of the theory to various departments of geology. In summary, Chamberlin's view is that the earth was formed by the infalling of small bodies of planetary matter about the "earth-knot"; the mass thus formed was subjected to gravitation adjustments from shrinkage, and to modifications from rotational acceleration and the pull of the moon. In present form the earth may be conceived as built up of six primary segments of conical shape. Two of the segments occupy the Pacific depression, two the Atlantic, and the remaining two the



Indian and Mediterranean-Black Sea region. There are other important features which can hardly be touched upon in this place. For a general treatise on the science of geology from a popular standpoint *The Earth, Its Life and Death* will be found valuable. It is the English version of the work by Berget of the Institut Océanographique de Paris.

**EARLY MAN IN AMERICA.** The question of man's origin in America has been brought once more to the fore by the discovery of human remains in association with Pleistocene fossils. The occurrence seems to be the most authentic of the kind that has been described up to the present. Previous evidence indicative of the early settlement of man in America—that is, as early as the closing stages of the Pleistocene, or the first part of the Stone Age—has lacked conviction, as in most instances there was reason to believe that the burials had not taken place in undisturbed ground and were later than the surroundings indicated. The preponderance of scientific opinion in this country seems to favor the view that man is a comparatively late immigrant, coming by the way of the Alaskan land bridge or by the South Sea Islands. The recent discovery was made by E. H. Sellards, State Geologist of Florida, near Vero in that State, where in the excavation of a canal a large number of fossil remains were uncovered. These included several parts of the human skeleton as well as those of the elephant, mammoth, giant sloth, horse, and other animals which lived in America during the Glacial Period, but have since become extinct. The stratum containing the remains consists of cross-bedded sands from 3 to 5 feet thick; it is capped by alluvial sand and muck, and rests upon marine shell marl. The bones occur all through the sand, and many are so fragile as to preclude the possibility of their having been washed into place. The human bones exhibit the same degree of mineralization as that of the associated fossils, and the overlying sand and muck are apparently in undisturbed condition. A few flints of very crude form have been found in the same material. Altogether the evidences seem favorable to a contemporaneous burial with the Pleistocene animals. No doubt the find will be given attention by anthropologists who will pass upon the character of the evidence and test the geological facts by those developed from study of the remains and the accompanying marks of human culture.

**STRATIGRAPHY.** A series of papers on the methods of stratigraphic correlation, published as a bulletin of the Geological Society of America represents perhaps the most complete and satisfactory exposition of this subject that has appeared up to the present. The problems involved, the methods of their treatment, and the limitations inherent in each method are set forth by E. O. Ulrich who sums up the matter with the conclusion that fossils are to be relied upon only for the identification of stratigraphic horizons, not for the division of geologic time in a broad way. The boundaries between epochs and periods are determinable only by those physical criteria that are involved in the vertical and horizontal movements of the earth's crust and that lead to a shifting of the border line between the water and the land. A geological age is regarded as terminating when the marine waters are largely or wholly withdrawn from the epicontinental basins, and the next age as opening

when the sea begins to advance again in the same basin or basins. This principle, the displacement of the strand lines, should be regarded as the main criterion for the determination of the natural divisions of geological time. Such displacement is accompanied by faunal changes; and frequently there is an unconformity between the bedding planes above and below. The value of fossil evidence in the subdivision of the record depends upon the closeness with which the biological characters and variations are discriminated; the more specialized the types used, the more reliable will be the results. Knowlton presents the subject from the standpoint of plant life, and W. D. Matthew describes the principles to be applied in the use of fossil vertebrates. Paleogeography in relation to correlation is discussed by C. Schuchert.

**PHYSIOGRAPHY.** A physiographic map of the United States is in course of preparation by a committee of the Association of American Geographers. The entire country is divided into 22 so-called physiographic provinces, with 80 smaller subdivisions or sections. A physiographic province is defined by the committee as an area that has had essentially the same geomorphological development, which means that it has undergone similar geological changes. As a groundwork for the study of physical geography the map should prove valuable. Its publication is to be undertaken as soon as possible.

E. Fischer presents an account of the effects of man in modifying the earth's features which he values as one of the leading factors. The mass of material moved each year in the production of ores, mineral fuels, and salt amounts to one cubic kilometer, whereas the entire industry of mining and quarrying accounts for twice that volume; and a further addition must be made for the earth and rock displaced in engineering and agricultural operations. The control of streams, the drainage of lake and swamp areas, the change of seasonal run-off, the denudation of forests, and the exploitation of groundwater resources represent some ways in which man interferes with physiographic processes. The influence of man, as that of natural agencies, is dominantly degradational.

Landslides as a method of degradation have been studied by D. H. Newland with especial reference to the gravity movements that take place in unconsolidated materials, like the sands and clays found in stream valleys. There are a number of different forms or types inclusive of surface creep, slumping and flows, earth avalanches, subsidence caused by lateral flowage of substratum, and subsidence accompanied by a reciprocal upward movement from unbalance pressure upon a liquid substratum, each of which has a characteristic impress upon the scenery. The influence of landslides in degradation is probably greater than has been generally believed, and locally it may predominate over all other processes, as instanced by the middle Hudson Valley where it is almost continuously active.

**GEOLOGICAL CLIMATE.** The climatic conditions during the geological past may be inferred, according to C. Schuchert, from the nature and color of sediments and their fossil content. Life forms, it is argued, have always been responsive to climatic influences, just as they are now. There is evidence of widespread glacial climates during at least four periods; two of them occur

during Pre-Cambrian time and two in the subsequent interval. The slate conglomerates of Ontario, Canada, are glacial formations of Lower Huronian age. In later Pre-Cambrian glacial conditions prevailed in two opposite parts of the globe, as shown by the tillites of northern Norway and southern Australia. The Peruvian period was accompanied by extensive glaciation in the equatorial regions and south temperate zone and left its traces in the beds of boulder-clay in South Africa, Brazil, India, and elsewhere. The last of the major glaciations was in the Pleistocene. Less well-marked cold periods seem to have occurred at other times, one at least in the Pre-Cambrian at a different age than either of those mentioned, another in the Lower Devonian, and a third in early Eocene. The cause of climatic conditions is to be sought primarily in periodic changes of the land surface; other influences are the variable supply of heat stored in the oceans and the radiation of heat by the atmosphere which varies with the composition, particularly with the proportion of carbon dioxide present.

**OCEANIC DEPOSITS.** Discoveries of deep-sea beds that have been upraised into land interest the geologist who finds in them evidence of profound changes in the relation of continent and ocean. They are directly related to the theory of crustal instability which has led to the uplift and later disappearance of land-bridges which are postulated by paleontologists on the basis of faunal migrations and which are exemplified, for instance, by Gondwanaland that once united India, Madagascar, and South Africa. An authentic occurrence of deep-sea deposits in Central Borneo was brought to notice a few years since, and has been recently described by Molengraaf. The strata consist of hard semi-transparent quartz rock which is made up almost wholly of radiolaria skeletons, and of reddish argillaceous chert with few radiolaria. The chert corresponds to the familiar red-clay of the deep-sea and the quartz to a hardened ooze. They are thought to be of Jurassic age and bear evidence of a change in the conformation of the land of much greater area than that represented by their occurrence.

**ISOSTASY.** W. H. Hobbs contributed a critical analysis of the theory of isostatic compensation as propounded by Hayford whose work was reviewed in an earlier volume of the YEAR BOOK. The anomalies of gravity which lie at the basis of the theory may be explained, in some examples at least, by abnormalities of magnetic forces or be connected with areas of seismic intensity; such is stated by Hobbs to be true for gravity determinations in Hungary where very complete and accurate data are available. In the United States it is noteworthy that the stations used by Hayford in his determinations showing the highest variations from the normal lie mainly in the intense seismic area of the Pacific Coast, while a second group of lesser intensity is found in the Atlantic coastal plain. From the facts of this distribution it seems proper to conclude that in restricted areas where crustal disturbance is in progress, as manifested by earthquakes, no complete isostatic compensation is possible. Such regions show a rigidity sufficient to support their excessive loads for long periods, and whatever adjustment takes place lags behind the effects of surface erosion and transportation. This does not necessarily imply that there is not

a tendency toward isostatic adjustment over large areas like that included in the main part of the United States, but there are sections where its influence seems annulled by other forces.

**PETROLOGY.** The crystallization of igneous magmas affords an interesting field of experimental study which has been taken up by the Carnegie Geophysical Laboratory with marked success. In one of the later contributions from this source, N. L. Bowen describes the mixtures of the series albite-anorthite-diopside which corresponds quite closely to certain simple types of igneous rocks, such as diorite and gabbro. He states that the composition of the feldspar varies not only with the original composition of the liquid but with the rate of cooling. Zoning, a feature frequently observed in the feldspar of rocks, tends to occur where the process of cooling is not sufficiently slow for the continual attainment of equilibrium. In the system plagioclase-diopside no eutectic point exists, and it is not likely that the natural rocks made up of these ingredients really represent a eutectic mixture. This conclusion has a direct bearing upon the theory of differentiation of magmas by crystallization.

Johnston and Williamson describe the operation of inorganic agencies in the deposition of calcium carbonate, for which they claim a more prominent place than has been accorded to them. The importance of this method of limestone deposition depends in the first place on the degree of saturation of the water, since the more nearly saturated the solution the greater is the chance of a permanent deposit. Temperature, salinity, and particularly concentration of carbon dioxide are the determining factors in the solubility of calcium carbonate.

**ORE DEPOSITS.** The principle of the secondary enrichment of sulphide ore bodies, one of the more important contributions by American students to this branch of geology, continues to occupy a prominent place in discussions with the realization that there is yet much to learn about the precise methods of its operation and its application in particular instances. The chemical reactions involved are particularly in need of further explanation. As exemplified by copper ores the general features of the process consist of oxidation near the surface under weathering influences, whereby copper sulphate is formed together with iron sulphate and sulphuric acid; these substances, being soluble, are carried downward by meteoric waters to the region of unaltered sulphides where a reaction takes place, leading to the deposition of a copper mineral higher in copper content than the original sulphide. By this method bodies of high-grade ore are not infrequently formed in depth, whereas the ore in the upper part of the vein may be more or less leached of its copper. To ascertain the chemical reactions that take place Zies, Allen, and Merwin have experimented with various natural sulphides like chalcocite, covellite, bornite, chalcopyrite, pyrite, pyrrhotite, sphalerite, and galena which were selected with regard to purity and subjected to treatment with copper sulphate. In all instances where the minerals came in contact with the solution an enrichment product resulted, either some one of the higher sulphides or metallic copper and cuprite. A certain amount of sulphate of the metal contained in the original sulphide also was produced, and some sulphuric acid as well. The

secondary product was crystalline and firmly adherent to the altered sulphide, just as happens in nature; its precise character depended upon the particular mineral employed. It was found that pyrite and chalcopyrite alter to covellite and chalcocite, bornite and covellite to chalcocite, and sphalerite and galena first to covellite and subsequently to chalcocite. From this it appears that the order of stability of the secondary minerals is chalcopyrite, covellite, chalcocite; each species changing to the succeeding one under the further action of copper sulphate. The investigation is still in progress and promises to yield further results of great value in the practical study of ore deposits.

A description of the Wabana iron ores of Newfoundland, by A. O. Hayes, brings to light some novel features in regard to the composition and origin of the ores, which for a time were regarded as the equivalents of the Clinton hematite deposits of this country. It is shown, however, that the Wabana beds are of lower Ordovician age, or considerably older than the Clinton strata. The ores are composed of small spherules or oölites of hematite and chamosite, the two minerals often occurring in alternating layers with a central nucleus of quartz or some other foreign matter. They are the products of marine deposition at the same time as the enclosing strata. It is thought that the iron existed in solution in the sea water and was precipitated by the action of ammonia formed by the decomposition of organic matter, to be later oxidized into hematite through the oxygen given off by algae in their life process. The tubes of these low organisms are found in such relation to the spherules as to indicate their activity in the change of the iron from ferrous to ferric state before consolidation of the sediments occurred. The oölites or spherules are themselves the result of inorganic processes in which surface tension was a controlling factor.

**OCCURRENCE OF PETROLEUM.** A laboratory demonstration of the influence of capillarity on the accumulation of petroleum is described by A. W. McCoy. Without going into the details, it is brought out that the segregation of oil and water in the capillary openings of rocks does not follow hydrostatic principles, but the water by reason of its superior capillary force drives the oil into the larger openings without reference to the structure or elevation of the strata. The difference in the capillary pressures of the two liquids for openings, measuring one-hundredth of a micron in diameter, is approximately 200 atmospheres or 400,000 pounds to the square foot, which of itself may suffice to cause up-arching or doming of the strata. At any rate the pressure would force the oil into the anticline, if it were already in existence, as the larger openings would be found there.

**GEOPHYSICAL LABORATORY.** See **CARNegie INSTITUTION OF WASHINGTON.**

**GEORGE, DAVID LLOYD.** See **LLOYD GEORGE, DAVID.**

**GEORGE, HENRY, JR.** An American political economist, journalist, and Congressman, son of Henry George, the famous single-tax advocate, died in Washington, D. C., Nov. 14, 1916. He was born in Sacramento, Cal., in 1862, had a public school education, and at 16 entered a printing office. A year later he became his father's private secretary. The two continued in close relationship, and the son was

intrusted with important work in the field of his father's interests. They were abroad together in 1884, in which year Henry George, Jr., joined the staff of *London Truth*. Afterward, for a time, he was an editor of the *North American Review*, and from 1887 to 1891 managing editor of *The Standard*, a single-tax paper founded by the elder George. For short periods he served as correspondent in Washington and in England for a syndicate of Western papers, and as editor of the *Florida Citizen* of Jacksonville. In 1897 the Jeffersonian party chose Mr. George as its candidate for mayor of New York, to replace his father, who died during the campaign. He failed of election. In 1909 he went round the world for *Collier's Weekly*. In 1911 he was elected to Congress from New York and in 1913 was reelected. He wrote: a biography of his father; *The Menace of Privilege*; and *The Romance of Henry Bainbridge*.

**GEORGE, W. L.** See **LITERATURE, ENGLISH AND AMERICAN, Fiction, American**; also **FEMINISM.**

**GEORGETOWN UNIVERSITY.** A Roman Catholic educational institution for men at Washington, D. C. It was founded in 1789. In the autumn of 1916 the students numbered 1390 and the instructors 196. During the year a new course in banking and finance was established. The library contains about 155,000 volumes. President, Very Rev. A. J. Donlon, S. J.

**GEORGE WASHINGTON UNIVERSITY.** A non-sectarian institution for the education of men and women at Washington, D. C. It was founded (as Columbian University) in 1821. In 1916, 1973 students were registered and the faculty numbered 234. Endowments amounting to \$4825 and other gifts totaling \$9865 were received. In productive funds the institution had \$104,670 and its income for the last year was \$4461. The library contains 50,000 volumes. President, Charles H. Stockton.

**GEORGIA. POPULATION.** The estimated population of the State on Dec. 3, 1916, was 2,875,953. The population in 1910 was 2,609,121.

**AGRICULTURE.** The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn . . . . . 1916	4,000,000	62,000,000	\$62,000,000
1915	4,330,000	64,950,000	50,661,000
Wheat . . . . . 1916	334,000	3,808,000	7,083,000
1915	325,000	3,575,000	4,612,000
Oats . . . . . 1916	860,000	16,770,000	13,248,000
1915	905,000	17,648,000	11,648,000
Rice . . . . . 1916	800	16,000	14,000
1915	900	26,000	23,000
Potatoes . . . 1916	15,000	900,000	1,575,000
1915	16,000	1,040,000	1,030,000
Hay . . . . . 1916	800,000	a 275,000	6,075,000
1915	300,000	345,000	5,210,000
Tobacco . . . 1916	1,300	b 1,534,000	414,000
1915	1,700	1,496,000	344,000
Cotton . . . . 1916	5,344,000	c 1,845,000	175,463,000
1915	4,825,000	1,909,000	104,013,000
Rye . . . . . 1916	13,000	124,000	198,000
1915	13,000	120,000	168,000

a Tons. b Pounds. c Bales.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the fol-

lowing comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments . .	4,792	4,639
Average number of wage earners . . . . .	104,588	104,461
Capital invested . . . . .	\$202,778,000	\$258,326,000
Wages . . . . .	34,805,000	38,128,000
The value of materials used . . . . .	116,970,000	160,089,000
The value of products . . . . .	202,868,000	258,271,000

**MINERAL PRODUCTION.** The State is not important as a producer of minerals. Coal is the only mineral produced in any quantity, and this amounts to about 250,000 tons per year.

**TRANSPORTATION.** The total railway mileage in the State on June 30, 1915, was 7295. This was increased during 1916 by the construction of a small amount of mileage. The Savannah and Atlantic Railroad built about 35 miles of new track. Ocmulgee Valley Railroad built about 21 miles, and the Washington and Lincolnton about 13 miles. The railways having the longest mileage are the Central of Georgia, 1330; the Atlanta, Birmingham, and Atlantic, 486; the Southern Railway Company, 913; and the Sea Board Air Line, 744.

**EDUCATION.** The total school population of the State in 1915, the latest date for which statistics are available, was 795,484. The total enrollment was 625,854, and the average daily attendance was 422,728. The total value of school property was \$14,691,213. The total number of teachers was 14,382, with salaries ranging from \$60.25 for white male teachers to \$25.63 for female colored teachers. The total amount raised for educational purposes of all kinds in 1915 was \$8,313,791.

**FINANCE.** The year 1915 is the latest for which statistics are available. On Jan. 1, 1915, there was in the treasury a balance of \$787,455. The receipts during the year were \$10,158,134, and the disbursements \$10,102,791, leaving a balance in the treasury on Jan. 1, 1915, of \$842,799. The bonded indebtedness of the State was reduced \$100,000 on Jan. 1, 1916, making the total bonded indebtedness \$6028. In addition to this the State is obligated for the land script fund, amounting to \$90,202.

**POLITICS AND GOVERNMENT.** The political activity in 1916 centred around the election for Governor. There was no election for United States Senator. At the State-wide primaries held on September 12th, Hugh M. Dorsey was nominated for Governor, defeating Gov. Nat E. Harris, and several other candidates. Mr. Dorsey was the prosecutor of Leo M. Frank, who was convicted of murder in 1915, and was lynched by a mob. His nomination was strongly opposed, but was won by a plea to elect a Governor who would enforce the law. In the presidential election Wilson received 125,831 votes, Hughes 11,225, and the Progressive candidate 19,085. In 1912 Wilson received 93,076, Taft 5191, and Roosevelt 21,980. On January 12th, three Federal judges upheld in a decision the Prohibition laws of the State, overruling a contention that the law was unconstitutional. On May 1st new prohibitory laws went into effect making the selling of liquor much more difficult than under the former law. Under the terms no beverage containing as much as one-half of 1 per cent of alcohol can be lawfully sold in the State. This resulted in the closing

of many saloons, locker clubs, and beer gardens. (See LIQUOR REGULATION.)

On March 22nd a fire swept over an area of 1¼ miles in Augusta, destroying 10 business blocks and 20 blocks of residences. Among the buildings burned was St. Paul's Episcopal Church, which was 125 years old, and the homes of two local newspapers. One life was lost, and there was a property loss of \$5,000,000, including \$2,000,000 worth of cotton.

**STATE OFFICERS.** Governor, Hugh M. Dorsey; Secretary of State, Philip Cook; Treasurer, William J. Speer; Comptroller, W. A. Wright; Attorney-General, Clifford Walker; Adjutant-General, J. Van Holt Naah; Superintendent of Education, M. L. Brittain; Commissioner of Agriculture, J. J. Brown—all Democrats.

**JUDICIARY.** Supreme Court: Chief Justice, William H. Fish; Presiding Justice, Beverly D. Evans; Associate Justices, M. W. Beck, Samuel C. Atkinson, H. W. Hill, and S. P. Gilbert; Clerk, Z. D. Harrison.

**STATE LEGISLATURE.** Almost wholly Democratic.

**GEORGIA, UNIVERSITY OF.** A State educational institution at Athens, Ga., founded in 1801. In the fall of 1916 the student body numbered 701 and the faculty 63. In productive funds the university has \$389,306, and in 1916 from all sources it drew an income of \$131,821. In the library are 41,000 volumes. Chancellor, David Crenshaw Barrow.

**GERMAN EAST AFRICA.** A protectorate of Germany (see GERMAN PROTECTORATES) bordering the Indian Ocean from the mouth of the Umba to lat. 10°40' S. and thus lying between the East Africa Protectorate (British) and Portuguese East Africa. It extends to Victoria Nyanza at the north, Lake Tanganyika at the west, and Lake Nyassa at the south. Capital, Dar-es-Salaam. The protectorate was established in 1885 by the Germans, who in 1890 acquired the rights of the Sultan of Zanzibar over a strip of coast territory by payment of 4,000,000 marks. The estimated area of the protectorate is 995,000 square kilometers (384,170 square miles). Estimated native population, 7,646,000; other colored, 15,000; whites (Jan. 1, 1913), 5336 (of whom 4107 German); total, about 7,666,000. Ten Protestant and three Roman Catholic missionary societies are represented in the protectorate. Number of schools before the outbreak of the great war 1944, with 114,964 pupils.

The natives practice agriculture to some extent, and grazing. In 1912 there were 3,950,250 cattle and 6,398,300 sheep and goats belonging to natives, and 43,617 cattle and 41,647 sheep and goats belonging to whites. The produce of the German plantations, which are mostly near the coast, includes coconuts, vanilla, tobacco, rubber, coffee, cotton, sisal, etc. Imports and exports in 1913 were valued at 53,358,000 and 35,550,000 marks respectively, as compared with 50,309,000 and 31,418,000 in 1912. Imports from and exports to Germany in 1912, 25,819,000 and 17,827,000 marks respectively. Principal exports in 1912 and 1913, in thousands of marks: sisal, 7359 and 10,710; rubber, 8426 and 6567; hides and skins, 4067 and 5591; raw cotton, 2110 and 2414; copra, 1563 and 2348; earthnuts, 1273 and 1918; insect wax, 829 and 1415; coffee, 1903 and 931; raw gold, 531 and 678. Railway in operation

in the spring of 1914, 792 miles; under construction, 104 miles. In the year 1913-14, local revenue was 16,506,000 marks; expenditure, 23,771,000; in addition, expenditure from loan, 37,500,000 marks. The budget for 1915-16, as well as that for 1914-15, balanced at 81,271,068 marks, the estimated revenue consisting of 20,471,068 marks local receipts, 3,300,000 marks imperial contribution, and 37,500,000 marks loan. German East Africa is the most valuable of the German protectorates.

**HISTORY.** In April there were five invading armies closing in on the last remaining German colony in Africa. The point toward which the troops were converging was the stronghold at Tabora on the Central Railway in the highlands. Lieutenant-Colonel Vandeventer's British column had already advanced to a point towards the Central Railway, driving the Germans before them. West of Victoria Nyanza, British troops took Bukoba early in July, while to the west of that point, Belgian troops had passed as far as Biaramula on June 24th and had occupied a point to the east of Lake Tanganyika. The column of Brigadier-General Northey by July 24th had advanced from Nyassaland, driving the Germans from strong positions. The circle was drawn still closer in August, British naval forces seizing, on August 1st, the port of Sadani, the important military coast station of Bagamoyo. In the south the Central Railway was cut at several points. The campaign of General Smuts had started from Nairobi as the base, whence an enveloping movement was directed toward Moshi, the terminus of the Tanga-Kilimanjaro railway. This was partly successful, but the enemy succeeded in making his escape along the railway. Moshi was captured after some severe fighting. The struggle was renewed along the line of the Tanga railway, but finally the enemy broke and fled. A peculiar feature of the campaign was the extraordinary composition of General Smuts's army, which contained not only native troops, and troops from every portion of South Africa, but Canadians and Australians as well. Practically the whole Empire was represented in that small fighting force. General Smuts's force began an advance movement on August 5th and soon reached the Majonga valley, where some stubborn resistance was encountered, but where on August 11th the Germans were put to rout. The invaders on August 15th had reached a point only 25 miles distant from the Central Railway. Meanwhile, to the west, Lieutenant-Colonel Vandeventer, after seizing several points on the Central Railway, defeated the enemy at a point to the west of Mpwapwa. The British took possession of two islands in Lake Tanganyika and on July 28th a German gun-boat was sunk by a Belgian gun-boat. Early in August Ujiji, the terminus of the Central Railway, was occupied. Brigadier-General Northey's column, after defeating the Germans on July 24th, made a considerable advance. A combined military and naval attack took Dar-es-Salaam on September 3rd, and there were other gains in that region. A little later landing parties occupied two ports about 170 miles to the south and still later all the remaining ports of the colony fell into their hands. Tabora was taken by the Belgians on September 11th. Portuguese troops entered the colony from Portuguese East Africa and advanced to Taketo, the Germans retreat-

ing before them. On December 11th, a further British advance of 60 miles on a front of 200 miles was reported. It started from Kissaki and New Iringa and reached the coast. See **WAR OF THE NATIONS.**

**GERMAN EVANGELICAL SYNOD OF NORTH AMERICA.** Communications of this denomination are to be found in practically all the States of the Union, though they are most numerous in the Central and North Central States. There were in 1916 1089 ministers, 1389 churches, and 274,787 communicants. The value of the church property is about \$1,500,000, and over \$1,000,000 a year is contributed for the maintenance of churches. Missions are carried on in India, where there are over 4000 adherents. The Eden Publishing House, the official publication agency of the denomination, is at St. Louis, Mo., and there is a branch at Chicago. There are literary committees in German and English. There are five periodicals published at St. Louis, besides Bible lessons and Sunday school helps. The Eden Theological Seminary is maintained at St. Louis, a college at Elmhurst, Ill., and Fort Collins Seminary. There are also charitable institutions for superannuated ministers, for the widows and orphans of deceased ministers, and for orphans. In 1916 a commission was appointed to discuss ways and means of bringing about closer relations with other churches at home and abroad. A fraternal message embodying the sentiments of the resolutions, favoring closer relations, was ordered to be transmitted to all Lutheran bodies, the German and Dutch Reformed Churches, and to the Moravian Church.

**GERMANIC PHILOLOGY.** See **PHILOLOGY, MODERN.**

**GERMAN LITERATURE.** When the Old World, after its acute and disastrous attack of war madness, returns to its senses and resumes the normal course of its foreign relations, it will be found that our records of its literary achievements during these turbulent times are sadly incomplete. For when even literary magazines are prevented from reaching this country and the book importation from Germany has practically ceased, the information which students of contemporary German letters can gain from the few available sources must necessarily be fragmentary. But even the meagre data that could be collected convey the impression that the publishing business, at least for the first half of the year 1916, was very little affected by the war. It cannot be denied, however, that the general standard of literary production is lower than it was before the war. The patriotic enthusiasm has so far not inspired a single work of such power that it would convincingly carry its message across the political boundary-lines. The dominant note is one of insistent self-righteousness, of challenge and defiance; the signs of a spiritual renaissance which one expects in the wake of such an ordeal as that through which the belligerent nations are passing, have not yet manifested themselves in the world of German letters. The writers who refrain from joining in the somewhat melodramatic effusions of an exaggerated nationalism continue to give us their pseudo-scientific conceptions of life in the naturalistic manner which other nations have discarded. There is no doubt, too, that the masters of German

classicism are being neglected. The number of books dealing with Goethe from a historical, critical, biographical, psychological, and even medical standpoint is visibly decreasing. One is tempted to infer that the man whose universal—not to say, cosmopolitan—mind conceived a world-literature, cannot well be covered by the Pan-German formula. Schiller fares no better. In his case one might infer that the flamboyant freedom-spirit of *Die Räuber*, *Don Carlos*, and *Wilhelm Tell* is—to say the least—uncongenial to the imperialistic Germany of to-day. Actuality is the paramount issue in German letters. Creative work of a purely imaginative character seems for the present almost paralyzed. History interests only as far as it touches upon national problems. Biography is uninteresting, where the individual life counts for so little. Hence the startling decrease in the number of historical, biographical, and other works which at other times figured largely on the book-market. The official and unofficial censorship, too, may affect those forms of literature which, for their effect, depend upon the unrestricted freedom of self-expression. Not a few German writers have found themselves hampered by the numerous "Verbote" of the authorities, and have been obliged to take up their residence in neutral countries and when their works, under the imprint of foreign publishers, found their way into the fatherland and contained passages trespassing against the spirit sanctioned by those authorities, they were promptly confiscated. It is safe to infer that the German writers residing in Switzerland and, like Hermann Hesse, writing for Swiss papers, represent the voice of that Germany which the authorities at home would like to silence. That even Maximilian Harden, who, at the outset of the war, was as loyally imperialistic as any champion of Pan-Germanism, was obliged to take up his abode in the neutral little republic, is significant. The sensations of the book-market have all come from Switzerland. Close upon the anonymously published *J'accuse*, which was the sensation of 1915, followed Hermann Fernau's *Gerade weil ich ein Deutscher bin* and after that Eduard Stilgebauer's novel *Inferno*, which shared with its predecessors the honor of being confiscated and forbidden in Germany.

FICTION. It seems natural that Helene Böhlau, the whole-souled woman whose stories of old Weimar have placed her in the first rank of German novelists, should at this time turn back to the period of Goethe and give us a story with the quaint title *Der gewürzige Hund*; for it is inconceivable that a woman of her universal grasp of life would be contented to restrict herself to the keynote of nationalism. Nor is it likely that Gabriele Reuter, the admirer of English and American thinkers, of Emerson, Whitman, Edith Wharton, and others, who a few years before the war took up her residence in Switzerland, is in her new novel *Das neue Land* voicing the current sentiment of the Berlin populace. Carry Brachvogel has chosen as the scene of her latest story, *Die grosse Gauklerin*, Venice, the beautiful sorceress among the cities of Europe. Dora Duncker, whose fame rests upon her truthful pictures of modern Berlin life, and who died during the year, wrote *Die graue Gasse*. Meta Schoepp's *Blockade* and Helene Mühlau's *Der Kriegs-*

*freiwillige* suggest by their titles that their authors were inspired by the actualities of the war. Georg Hirschfeld's *Der japanische Garten* does not in its title convey such suggestion, yet the time of the story is given as 1914. Georg Herrmann, whose *Jettchen Gebert* and *Henriette Jacoby* presented such delightful pictures of Berlin life in the first half of the nineteenth century, has written a novel on similar lines: *Heinrich Schön, Jr.* Kurt Münzer, also, gives us a novel of Berlin in his *Menschen von Gestern*. Hermann Hesse struck such a high mark with his first story, *Peter Camenzind*, that every book which has since come from his pen suffers by comparison. *Am Weg* is a thoughtful narrative of an intimate charm, but lacks the epic breadth of the earlier work, which seems destined to become a classic of the adolescent of the eighties. Hans Land's *Artur Imhoff* is another of those intimate character studies in which German fiction abounds, but the author does not reach in it the excellence of his previous work. The romance of Franz Schubert's life appeals strongly to the German temperament, and although barely four years have passed since the publication of a Schubert story by Rudolf Hans Bartsch, a novel by J. A. Lux, *Franz Schubert's Lebenslied*, deals with the friendships of the composer. Compared with the somewhat flippant and commonplace "journalism" of his recent novels, Kurt Aram's *Der elfenbeinerne Turm* suggests, at least in its title, a more serious note. Richard Voss rarely allows a year to pass by without a new story, though the quality of his work has long reached a uniform mediocrity which makes one wish he were less prolific; his new book, *Das Modell*, is no exception. Hanns von Zobeltitz, a writer whose popularity is greater than his attainments, is the author of a novel called *Die Fürstin Witwe*. Fedor von Zobeltitz has a reputation as a bibliophile which makes it very difficult to associate him with the authorship of some threescore volumes of light fiction, of which his humorous war-story, *Das vor schnell vermählte Ehepaar*, is the latest. Freiherr von Schlicht, the author of many humorous and satirical stories of army life in his country, has published a historical-patriotic novel under the title *Weit vom Schuss*. Among the works distinguished by an originality which sets them apart from the German fiction of the present is the weirdly fanciful Poe-esque story of the Ghetto of old Prague. *Der Golem*, by that master of quaint humor and pungent satire, Gustav Meyrink, whose contributions to *Simplicissimus* have been one of the most interesting features of that magazine. Another story of unique character is the semi-historical novel of the time of Kepler, *Tycho Brahe's Weg zu Gott*, by Max Brod. The novel which undoubtedly would have created the greatest sensation in Germany, had it not been promptly confiscated and "verboten," is *Inferno* by Eduard Stilgebauer. A realistic story of the present war, dauntlessly exposing some of the evils of the military system and sins of official Germany, Stilgebauer has voiced in this book the sentiments of those who have to grit their teeth in silence, and has in a measure redeemed his reputation which was somewhat impaired by the dubious advertising methods to which he—or his publisher—had resorted at the time of his début in German letters.

The number of books of short stories is, as usual, very great. It seems curious that many of them do not seem to take account of the grim reality of the present. Somehow books that are deliberately announced as "jolly" seem out of place at this time. Marie Stoma, who, some 20 years ago, was known in Young Germany as the author of several books of delightful lyric verse, has chosen a peculiar moment to send out her volume of stories entitled *Die Heidelerche und andere heitere Geschichten*. A. Achleitner figures on the title-page of a volume of hunters' stories: *Im grünen Roocke*. Karl Hans Strobl calls his book *Der Krieg im Alpenrot*. Helene Christaller's *Von Liebe* and Paul Ilg's *Was mein einst war* are good examples of the story of sentiment which is as popular in Germany as elsewhere. Bernd Isemann is a writer of no little originality, of which his latest book, *Maria im Tempel*, is a fair specimen. Heinrich Lilienfein seems to have interrupted his dramatic production by an excursion into fiction; *Im stillen Garten* is a book of pensive moods rather than dramatic moments. Gertrud Franke-Schievelbein, who some years ago attracted notice by a very well-told novel, has published a collection of stories under the suggestive title *Stilles Heldentum*. Anselma Heine is a clever story-teller whose *Fern von Paris* is bound to hold the attention of her readers. Carl Sternheim, one of the most uncompromising "moderns" of the present generation, has collected his previously published *Busekow*, *Napoleon*, and *Schuhlin* in a volume called simply, but proudly, *Die drei Erzählunaen*. A Swiss writer, Jakob Bühler, has published a volume of stories of war and peace under the title *Die Steinhauer Marie*. A posthumous volume by J. V. Widmann is entitled *Jugendeseleien*, and one by Marie Ebner-Eschenbach *Stille Welt*.

**DRAMA.** The dramatic production of the year has been singularly poor in works of genuine power. Nor has it been as much influenced by the war as has the fiction of the year. After Hermann Sudermann had taken cognizance of the prevailing depression in *Die entgötterte Welt*, which in a sub-title he called scenes of a diseased time, he promptly turned to a lighter and more popular theme and gave us the five-act tragi-comedy *Die gutgeschnittene Eoke*. But neither of the two works impressed the critics, who have been rather severe with the author for some years, as spontaneous genuine creations likely to become part of the repertory of the German stage. Ludwig Fulda, too, who among the writers of the older generation ranks next to Sudermann in popularity, did not add to his reputation by his play of modern life, *Der Lebensschüler*, which, besides other reminiscent features, harked directly back to the "motif" of *Sodoms Ende*. An Austrian dramatist who has come to the fore within the last decade and in contrast to his typically Viennese and rather decadent colleagues, Schnitzler and Hofmannsthal, represents the sturdy health of the Austrian mountain-folk, is Karl Schönherr. Whether he touches the theme of religious tolerance and prosecution, as in *Glaube und Heimat*, or presents the problem of the peasant on his soil in *Erde*, or satirizes the follies of woman, as in *Weibsteufel*, he is always sure of striking a note of wide appeal. The very title of his latest work, *Volk in Not*, suggests that

he is cleverly utilizing the curt phraseology to impress his readers and his audience and create a receptive mood. His work may fail to rise to any height of originality, but it is always simple and forceful in style, and shows his ability to play on the emotions of his audience. The part which Frank Wedekind plays in German drama is as much that of an *enfant terrible* as that of Bernard Shaw on the English stage. It has pleased Wedekind in his earlier unblushingly "naturalistic" works to call himself a "moralist," a label which seemed out of place for the man of the Mephistophelian smile and the puzzling paradox. He has seen fit under the pressure of the war to turn to a new field and has produced a historical drama in five acts: *Bismarck*. Wedekind's political creed being Pan-Germanism, it is, after all, quite in harmony with his complex character that he should pay loyal tribute to the man who is responsible for the Germany of to-day. Aside from Houston Stewart Chamberlain, who has valiantly proclaimed his "Teutonium" and taken an active part in the war literature, it seems possible in Bayreuth to keep aloof from the harassing conditions due to the war. For Siegfried Wagner has sent out a new fairy play, with the almost childlike title *An Allem ist's Hüthen schuld*. Undoubtedly he will, before long, make it into an opera. Walter Harlan, too, the author of many quaintly serious and humorous stories, strikes a blithesome note in his latest work, *In Kanaan*, which, in a sub-title, he calls "a merry mystery-play." Raoul Auernheimer, the author of many clever society plays, has written a comedy of the Congress of Vienna which he calls *Die verbündeten Mächte*. Hans Kyser, a writer of no little originality, has chosen for his theme the absorbingly interesting tragic life of Charlotte Stieglitz, one of the women who had given Berlin its first literary salons in the thirties. Georg Herrmann's *Henriette Jacoby*, dramatized from his novel of that name, belongs to the same period; but it is doubtful whether the play can equal the story, the charm of which lay in the intimate psychology and in an atmosphere which can rarely be carried beyond the footlights. Emil Strauss has published a new version of his tragedy, *Don Pedro*. Franz Blei, the valiant champion of Wedekind, Sternheim, and others, and himself a fair example of the decadence of Young Germany, is the author of a four-act comedy, *Logik des Herzens*. Oscar Jerschke, who for some years collaborated with Arno Holz, strikes a note sure of finding resonant echo at this time in his five-act drama of 1813, which he calls *Mein deutsches Vaterland*. A comparatively new name is that of Ludwig Jakob Ritter, who, in his *David*, with the traditional Bathsheba episode, announces the "dawn of man" and makes an attempt to suggest comparisons with the present. In spite of this new declaration of male supremacy, a number of women have successfully rivaled men in the dramatic production of the year. Lina Feuchtwanger is the author of a three-act drama, *Julia Farnese*, which presents an interesting variation of the Salome motif. Lu Vollbeh, who had so far been chiefly known as a novelist of great talent, has written a three-act play, called *Kathrin*. Else Feldmann attempts to rival Schalom Asch, the master of modern German Ghetto stories and

plays, in a four-act play of the Ghetto with the significant title, *Der Schrei den Niemand hört*.

POETRY. The lyric production of the year is proof of the habitual tendency of the German people to rush into verse at the slightest emotional suggestion, and surely this greatest of all wars is a worthier topic than they have had in a long time. Yet it does make a painful impression to see so sane and well-balanced a mind as that of Cæsar Fleischlen, who had occupied a rather unique position in the world of German poetry, succumb to the patriotic infection and join the mass chorus of sword-rattling, swash-buckling bards. When the war-madness is over, his book of verse with the rousing title *Kopf oben auf, Hand am Knauf, mein deutsches Volk . . . Sonn' auf* is not likely to have added to his prestige. Karl Ernst Knodt's choice of title, *Ich hott' einen Kameraden*, seems much more appropriate at a time when the war brings sorrow into so many a home. Anton Wildgans, the young Austrian, who only a few years ago made his début with a distinctly original volume of verse, calls his book of war poems simply *Oesterreichische Gedichte 1914-15*. The Swiss poet, August Bernoulli, suggests a return to the lore of his country in *Sankt Jakob's Helden-schlacht*. Anna, Baroness von Krane, who has for some time been identified with Catholic publications, is the author of a book of verse entitled *Der Friedensfürst*. Love lyrics, which are at other times far more numerous than others, were less in evidence on this year's book-market. Heinrich Hans Ehrler, who made his début a few years ago with a charming volume of idyllic prose, has written a book of verse, called *Die Liebe leidet keinen Tod*. Ilse Francke's *Das heilige Geheimnis* is a volume of poems dealing with the mystery of marriage. Alfons Petzold, the workingman-poet of Vienna, dedicates to the memory of his wife: *Johanna, ein Buch der Verklärung*. Richard Zoozmann, a prolific compiler and editor, has published an anthology of humorous poems under the title *Unartige Musenkinder*. A most interesting annual of verse and prose, *Vom jüngsten Tag*, presents the work of the generation that had begun to appear in print shortly before the war and claims for it after the war—"elbowroom to struggle for its ideas which are necessarily different from those of the older." The volume contains verse by Ernest Stadler and Georg Trakl, who were both claimed by the war, Georg Heym, Walter Hasenclever, Albert Ehrenstein, Johann Becher, Paul Boldt, Berthold Viertel, Alfred Wolfenstein, Max Brod, Rudolf Leonhard, Max Pulver, Paul Kraft, Ernst Blass, Else Lasker-Schüller, Rene Schickele, Paul Zech, and Franz Werfel. There are prose contributions by others.

LITERARY CRITICISM, ETC. That even books of a purely literary or critical character take their cue from current events and the nationalistic trend is evident from not a few of the recent publications. Dr. Ernst Elster, of the University of Marburg and one of the editors of Meyer's *Konversationslexikon*, is the author of *Deutschtum und Dichtung*. Artur Möller van den Bruck, who, a few years ago in a remarkable book of essays, spoke in extravagant terms of Russia and America as the youngest countries, those to whom the future belongs, has also been affected by the spirit of the present and discourses on *Der preussische Stil*. That

Heinrich Luden's *Goethe über Deutschland's Zukunft* is an attempt to divine what would have been the attitude of Goethe toward the Germany of to-day, seems a foregone conclusion. Rudolf Eucken contributes to this literature of the time *Die Träger des deutschen Idealismus*. Ludwig Fulda, too, the translator of Molière, Rostand, and others, has seized upon a timely topic in *Deutsche Kultur und Ausländerei*. The place and meaning of Heidelberg in German letters has been treated in Philipp Wittkopp's *Heidelberg und die deutsche Dichtung*. Dr. Hermann Nohl's *Typische Kunststile in Dichtung und Musik* is a readable essay on these closely related arts. A valuable contribution to the literature and history of the theatre is *Vor der Rampe*, by Dr. Heinrich Stümcke, for many years the editor of *Bühne und Welt*. A book of similar import is Julius Bab's *Die Frau als Schauspielerin*. Franz Blei, ever a protagonist of the ultra-modern, has sent out a volume called *Wedekind, Sternheim und das Theatre*. There have been critical appreciations of Grillparzer, Geibel, and others. Adolf Bartels has compiled 12 lists of the best German fiction under the title *Die besten deutschen Romane*.

BIOGRAPHY, MEMOIRS, ETC. Biography is very scantily represented among the books of the year. A new edition of Dr. Karl Federn's *Dante und seine Zeit* is the most important work. Important for the history of the theatre is the volume of reminiscences by Ernst Possart, *Erstrebtes und Erlebtes*. A volume of letters of Theodor Storm to his wife was welcomed by the many admirers of the writer whose *Immensee* still finds favor with students of German. Alexander von Gleichen-Russwurm, whose books on the history of social manners and customs have come to be looked for with eagerness, has written an interesting volume of grotesque satires under the title *Der Narrenturm*. Wilhelm Bölsche is alarmingly prolific, yet his scientific chats on nature and kindred subjects do not seem to lose any of their charm. This year he has published *Von Wundern und Tieren* and *Die deutsche Landschaft in Vergangenheit und Gegenwart*. Georg Herrmann, the novelist of Berlin life, has written a book of reflections and meditations entitled *Vom gesicherten und ungesicherten Leben*. Heinrich Lhotzky, whose books on ethical topics have a unique place in German letters, has sent out a book called *Vom heiligen Lachen*, which is not only attractive reading but full of suggestion. Emil Lucka, a student of psychology, whose writings are being translated into English, published *Grenzen der Seele*. Helene Lange, one of the champions of the woman's movement in her country, has contributed to the literature of feminism, *Die Frauenbewegung*.

CURRENT EVENTS. The number of books more or less directly inspired and influenced by the war is so large that only the most important names can be selected from the long list. The venerable Ernst Haeckel is struggling with the problem of the cataclysm that has engulfed the Old World in a book entitled *Weltkriegsgedanken über Leben und Tod, Religion und Entwicklungslehre*. Dr. Karl Lamprecht has outlined a picture of the Germany to be in *Deutschlands Zukunft*. Ferdinand Avenarius, the dignified editor of *Der Kunstwart*, has been shocked by the part which the



war cartoon is playing in shaping public opinion and has written *Das Bild als Verleumder*. Theodor von Sosnowsky presents a political study entitled *Der Dreißigj. Rudolph*. Hans Bartsch offers a commentary on the war in *Das deutsche Volk in schwerer Zeit*. Ernst Borkowaky writes under the well-worn title *Unser heiliger Krieg*. Julius Bab offers his reflections on the events of the present in a volume called *Am Rande der Zeit 1914-15*. True to the tendency of modern Germany to drag the sex problem into the discussion of almost any subject, Dr. Helene Stöcker has written *Geschlechtspsychologie und Krieg*. Books of current war history from the national standpoint are innumerable. Eberhard Bucher is publishing a series of *Kriegsdokumente*. Adolf Köster has written *Die stille Schlacht. Kriegsberichte aus dem Hauptquartier*. Wilhelm Schmidtbonn's *Menschen und Städte im Krieg*, Karl Franz Ginzkey's *Die Front in Tirol*, Ferdinand Gregori's *Sachsenspiegel*—a book of impressions of the second year at the west front—and many others are more or less journalistic in origin, but will take their place in the library of "documents" of the war. Stanislas Przybyzowski, the erratic and bibulous genius, who for the past 25 years has been alternately residing in Germany and in Poland and writing in the two languages, seems under the pressure of the present to have asserted his loyalty to Germany by taking up the all too popular cue of the "holy war" in his book *Polen und der heilige Krieg*.

**NEW EDITIONS.** Among the new editions put on the market have been some curiously interesting revivals. The most important from the political standpoint is a German edition of selections from the works of Frederick the Great which were originally written in French: *Friedrichs des Grossen Ausgewählte Werke*. That Heinrich Heine's choice satire, *Deutschland ein Wintermärchen*, should appear in a new edition at this moment, seems almost like a joke which escaped the notice of the censor. From a literary standpoint the new interest in E. T. A. Hoffmann, the erratic but undoubtedly most original of German romanticists, is to be welcomed. A volume of his diaries and literary fragments has appeared and a new edition of *Lebensansichten des Kater Murr*, a work of which it can safely be said that it has no parallel in the world's literature. There has been put on the market a critical edition of Martin Luther's complete works, Hermann Grimm's *Aufsätze zur Literatur*, and Gottfried Keller's *Die drei gerechten Kammerherren* have appeared in new editions. Friedrich Hebbel's dramatic works have been published in four volumes. A volume of Karl Stieler's poems in Bavarian dialect have appeared under the title *Verse*. The complete works of Theodor Fontane, Theodor Storm, and Heinrich Seidel, and the complete poetical works of J. V. von Scheffel and Ernst von Wildenbruch have been put on the market.

**TRANSLATIONS.** The number of translations into German seems to have decreased. Still the list contains such works as Frederik van Eeden's *Paul's Awakening*, Selma Lagerlöf's *Trolls and Men*, Eleanor Porter's *Marian*, Gabriele Zapolska's *Summer Love*, and others. There have also appeared some translations of the classics, among them Catullus and Sopho-

cles. Among works translated from the German into other languages there have been few that did not directly refer to the war. But one of the most interesting facts to be noted is the translation into French of Carl Spitteler's *Olympischer Frühling* and *Leutnant Konrad*, works of a Swiss poet who had been a great favorite in Germany, until he openly declared himself in favor of the Allies.

**MISCELLANEOUS.** Among the literary events of the year must be noted the newly resumed activity of the censor. It manifested itself in Breslau by prohibiting the performance of Arthur Schnitzler's *Professor Bernhardt*, in Essen of Max Halbe's *Jugend*, in Danzig of Carl Schönherr's *Weibeteufel*, in Mayence of Hermann Sudermann's *Ehre* and Karl Leyse's *Danton*, and in Berlin of Carl Sternheim's *Der Snob* and four other plays, and of Strindberg's *Fräulein Julie*. On the other hand, Carl Sternheim has been awarded the Fontane prize for his three stories, *Busekow*, *Napoleon*, and *Schuhlin*. John Henry Mackay, a poet of Scotch birth, but a naturalized German, who played a prominent part in the literary revolution of the eighties, is the recipient of the Specht prize of 3000 marks.

**NECROLOGY.** Among the writers who have died during the year are not a few that will be sadly missed. The best known among them was undoubtedly Johannes Trojan, the octogenarian, who for some 20 years edited the comic weekly *Kladderadatsch* and had a number of books of humor and satire to his credit, but none of them as popular and as charming as his juveniles. A figure no less popular in, and identified with, the life of Vienna, has passed away in Vincenz Chiavacci, who, in spite of his 70 years, was still active and as editor of the *Wiener Bilder* and the humorous pages of the *Oestreichische Volkzeitung* will not easily find a worthy successor. Chiavacci was the author of many volumes of sketches and stories of Viennese life, some farces, the biographies of Ludwig Ganghofer and Ludwig Azengruber, and was one of the editors of the complete works of Nestroy. Lily Braun (q.v.) had become famous as a feminist as well as for her writings. Dora Duncker and Marie, Baroness von Ebner-Eschenbach (Austrian), are two other women writers of note who have died. In Count Franz Lützow Germany lost a great authority on Czech history and literature. The loss of Ernst Sieper, Germany's greatest authority on English literature and art, for some time connected with the Early English Text Society and of late lecturer at the university of Munich, is perhaps for the present irretrievable. For Sieper did not share the anglophobia of the majority of his colleagues, ridiculed the attempt to Germanize Shakespeare, and only a short time before his death protested against the chauvinism and imperialism which destroyed the work of decades, the slow building up of a literature of international understanding and cooperation. Among the poets whose loss will be felt is Gustav Falke, a writer of the generation of Liliencron. For authors just mentioned and for Berlepsch, Hansjakob, Hirth, Pochhammer, and Schlenther, see NECROLOGY. See also ELIZABETH.

**GERMAN NEW GUINEA.** A protectorate of Germany, occupied by British troops in 1914 (see GERMAN PROTECTORATES), including Kaiser-

Wilhelmsland (the northeastern part of the island of New Guinea), the Bismarck Archipelago, and the German Solomon Islands. The estimated area is 240,000 square kilometers (92,664 square miles). The capital is Rabaul, on the island of Neu-Pommern. Dependencies of the protectorate are the Caroline, Palau, Mariana (or Ladrone), and Marshall islands; their area is given as 2476 square kilometers (956 square miles). Germany declared a protectorate over Kaiser-Wilhelmsland and the Bismarck Archipelago in 1884, and acquired the Micronesian dependencies from Spain in 1899. The total native colored population of protectorate and de-

man Samoa, and Kiaochow. The total area, which is estimated at about 1,140,000 square miles, is nearly five and one-half times the area of Germany. The population of many districts is conjectural, but the total has been estimated at about 13,237,000. German New Guinea includes Kaiser-Wilhelmsland (the northeast part of the island of New Guinea), the Bismarck Archipelago, and the German Solomon Islands. The estimated area and population of the several protectorates, with their capitals, or administrative headquarters, are shown in the accompanying table; the figures for white population relate to Jan. 1, 1913.

Protectorates	Sq. km.	Sq. m.	Colored		White		Capital		
			Total	Native	Total	German			
East Africa .....	995,000	884,170	7,661,000	7,646,000	5,336	4,107	Dar-es-Salaam		
Kamerun .....	790,000	805,019	*8,661,000	*8,649,000	1,871	1,643	Buša		
Togo .....	87,200	83,658	1,032,000	1,030,000	368	320	Lome		
Southwest Africa .....	885,100	822,432	84,000	81,000	14,880	12,292	Windhuk		
<b>Total Africa .....</b>	<b>2,707,300</b>	<b>1,045,289</b>	<b>12,428,000</b>	<b>12,406,000</b>	<b>22,405</b>	<b>18,362</b>			
New Guinea .....	240,000	92,664	602,000	600,000	968	746	Rabaul		
Caroline, Marshall, Palau, Mariana Islands .....	2,476	956					459	259	Rabaul
Samoa .....	2,572	993					544	329	Apia
<b>Total in Pacific .....</b>	<b>245,043</b>	<b>94,613</b>	<b>640,000</b>	<b>635,000</b>	<b>1,971</b>	<b>1,334</b>			
Kiaochow .....	552	213	190,000	187,000	4,470	4,256	Tsingtao		
<b>Grand total .....</b>	<b>2,952,900</b>	<b>1,140,115</b>	<b>13,258,000</b>	<b>13,228,000</b>	<b>28,846</b>	<b>23,952</b>			

\* The official German estimate is 1,000,000 less but by France in 1911.

it does not include the population of the territory ceded

dependencies is estimated at 600,000, and the number of other colored inhabitants at 2000. White inhabitants of the protectorate at the beginning of 1913 numbered 968 (German, 746), and of the dependencies, 459 (German, 259). There are five Roman Catholic and four Protestant missionary societies represented in German New Guinea. According to the latest available report, schools numbered 516, with 18,486 pupils.

Trade statistics are not available later than for 1912; imports to and exports from the protectorate and dependencies have been as follows, in thousands of marks:

	Imports		Exports	
	1911	1912	1911	1912
Protectorate .....	5,299	5,872	4,109	5,041
Dependencies .....	2,716	3,385	7,917	7,046
<b>Total .....</b>	<b>8,015</b>	<b>9,207</b>	<b>12,026</b>	<b>12,087</b>

The chief export is copra, valued at 4,501,000 marks in 1911 and 6,010,000 marks in 1912; the share of the dependencies in the copra export was 1,169,000 marks in 1911 and 1,958,000 marks in 1912. The most important export of the dependencies is phosphate, valued at 6,558,000 marks in 1911 and 4,991,000 in 1912. In 1911 and 1912 respectively, imports from Germany amounted to 3,422,000 and 3,177,000 marks; exports to Germany, 6,484,000 and 6,480,000 marks.

The budget for 1915-16, as well as the budget for 1914-15 balanced at 3,833,886 marks, the estimated receipts including an imperial contribution of 1,717,022 marks.

**GERMAN PROTECTORATES.** The colonial possessions of Germany, or protectorates (Schutzgebiete) as they are called, are German East Africa, Kamerun, Togo, German Southwest Africa, German New Guinea, Ger-

man East Africa borders the Indian Ocean somewhat south of the equator; its land frontiers march with those of British, Belgian, and Portuguese possessions. Kamerun, which lies on the opposite side of the continent, touches the eastern part of the Gulf of Guinea; it is bounded on the northwest by British and on the east and south by French territory, while its coast line is broken by the small Spanish colony of Rio Muni y Cabo San Juan. Togo extends inland from the north shore of the Gulf of Guinea between the Gold Coast (British) and Dahomey (French). German Southwest Africa is bounded by Portuguese territory on the north and British territory on the east and south; its long Atlantic coast line is broken by the small British possession of Wal-fish Bay. Kiaochow is on the east coast of the Chinese province of Shantung.

The commerce of the German protectorates is shown below, in thousands of marks:

	Imports		Exports	
	1912	1913	1912	1913
East Africa .....	50,809	53,358	31,418	35,550
Kamerun .....	34,242	34,616	28,336	29,151
Togo .....	11,428	10,631	9,959	9,138
Southwest Africa ..	32,499	43,426	39,035	70,302
<b>Total Africa ..</b>	<b>128,478</b>	<b>142,031</b>	<b>103,748</b>	<b>144,141</b>
New Guinea .....	5,872	.....	5,041	.....
East Caroline and Marshall Islands.	1,963	.....	5,164	.....
West Caroline, Palau, and Mariana Isls.	1,372	.....	1,882	.....
Samoa .....	4,994	5,676	5,045	5,339
<b>Total Pacific ..</b>	<b>14,201</b>	<b>.....</b>	<b>17,132</b>	<b>.....</b>
Kiaochow * .....	121,254	.....	79,640	.....
<b>Grand total...</b>	<b>263,933</b>	<b>.....</b>	<b>200,520</b>	<b>.....</b>

\* Including hinterland.









The length of railway in operation was as follows at the beginning of 1913 and the beginning of 1914:

	Km. 1913	Km. 1914	Miles 1914
<b>East Africa:</b>			
Usambara Ry. ....	352	352	219
Tanganyika Ry. ....	847	1,083	678
Total .....	1,199	1,435	892
<b>Kamerun:</b>			
Northern Ry. ....	160	160	100
Midland Ry. ....	81	150	98
Total .....	241	310	198
<b>Togo:</b>			
Lome-Anecho .....	44	44	27
Lome-Palime .....	119	119	74
Lome-Atakpame .....	160	164	102
Total .....	323	327	203
<b>Southwest Africa:</b>			
Otavi Ry. ....	671	671	417
Swakopmund-Windhuk ...	382	382	237
Northern Ry. ....	506	506	314
Southern Ry. ....	545	545	339
Total .....	2,104	2,104	1,807
<b>Kiaochow (incl. ry. in Shan-tung)</b>			
.....	436	436	271
Grand total .....	4,303	4,612	2,866

At the end of 1916, East Africa was the only German protectorate that had not been conquered by the Allies. A large part of it, however, together with the railways, had fallen to the invading forces, which included British, South African, Belgian, and Portuguese troops. The protectorate was established in 1885.

The Kamerun protectorate dates from 1884. The protectorate was invaded by British and French forces in the autumn of 1914 and was finally conquered in February, 1916. For administration the country has been divided between the British and French.

The Togo protectorate was established in 1884. It was conquered by Anglo-French forces late in August, 1914, after a three-weeks' campaign. Part of the country is under French and part under British administration.

The Southwest Africa protectorate was also established in 1884. The protectorate was invaded by South African forces soon after the outbreak of the great war and was finally conquered in July, 1915. It is administered by the Government of the Union of South Africa. German New Guinea was occupied by the British in 1914.

A German protectorate was declared over Kaiser-Wilhelmsland and the Bismarck Archipelago in 1884. These lands and the German Solomon Islands were occupied by Australian troops in September, 1914, and have since been administered by the commonwealth government. The Caroline, Marshall, Palau, and Mariana islands were acquired by Germany in 1899; they were taken by Japan in October, 1914.

The protectorate of Samoa was established in 1900. It surrendered to a New Zealand force late in August, 1914, and has since been administered by the Dominion government.

Kiaochow was declared a German protectorate in 1898. In November, 1914, Tsingtao surrendered to Japanese and British forces, and has since been administered by the Government of Japan.

Y. B. 16—10.

See GERMAN EAST AFRICA; GERMAN NEW GUINEA; GERMAN SAMOA; GERMAN SOUTHWEST AFRICA; KAMERUN; KIAOCHOW; TOGO.

**GERMAN REFORMED CHURCH.** See REFORMED CHURCH IN THE UNITED STATES.

**GERMAN SAMOA.** Samoa, or the Samoan Islands, is a group in the Pacific Ocean about 14° S., having a total area of about 1070 square miles. The islands east of 171° E. belong to the United States (chief islands are Tutuila and Manua). The islands west of 171° E. constitute a German protectorate, established in 1897; its total area is about 994 square miles, including Savaii (652.9 square miles), Upolu (335.5), Manono (3.3), and Apolima (1.8). Germany acquired the islands in 1900. The administrative headquarters is at Apia, in Upolu. The native colored population is estimated at 35,000; other colored, about 3500, of whom about 2100 Chinese; whites in 1914, 600, of whom 373 German and 140 British. There are one Protestant and one Roman Catholic missionary society represented in German Samoa. Trade returns, in thousands of marks: imports and exports respectively, in 1912, 4994 and 5045; in 1913, 5676 and 5339; imports from Germany in 1912 and 1913, 986 and 1199; exports to Germany, 2536 and 2973; copra export in 1912 and 1913, 4070 and 4121; cacao, 840 and 1063; rubber, 111 and 91.

The budget for 1915-16, as well as the budget for 1914-15, balanced at 1,374,354 marks, the estimated revenue consisting wholly of local receipts.

On Aug. 29, 1914, British colonial troops occupied Apia. During the war German Samoa is administered by New Zealand. See GERMAN PROTECTORATES.

**GERMAN SOUTHWEST AFRICA.** A protectorate of Germany (see GERMAN PROTECTORATES) between Angola (Portuguese) and the Cape Province of the Union of South Africa (excepting Walfish Bay, which belongs to the Cape Province). Windhuk is the administrative headquarters of the protectorate, which was established in 1884. The estimated area is 835,100 square kilometers (322,432 square miles); of the German protectorate, Southwest Africa is the largest excepting East Africa. The population is sparse, the estimated number of native colored inhabitants being about 81,000; other colored, 3000; white (Jan. 1, 1913), 14,330, of whom 12,292 Germans. Two Protestant and two Roman Catholic missionary societies are represented in the protectorate. Stock raising and mining (diamonds, copper) have hitherto been commercially more important than agriculture. The reported number of cattle decreased from 90,385 in 1903 to 52,531 in 1907 and then steadily increased to 205,643 in 1913. Other live stock in 1913 included 15,916 horses, 13,618 mules and asses, 53,691 wool sheep, 17,171 Persian sheep, 11,194 karakul, 472,585 mutton sheep, 485,401 goats, and 31,503 Angora goats. Diamonds are found in the vicinity of Lüderitzbucht; production in 1911-12, 766,465 carats. Trade returns, in thousands of marks: imports and exports respectively in 1912, 32,499 and 39,035; in 1913, 43,428 and 70,302; imports from and exports to Germany in 1912, 26,442 and 32,454; diamond export in 1912 and 1913, 30,414 and 58,910; copper ore, 6523 and 7929; tin ore, 9 and 632; hides and skins, 298 and 521; wool, 150

and 126. The export of copper ore amounted to 42,775 metric tons in 1912 and 47,345 in 1913.

In German Southwest Africa there were 1318½ miles of state-owned and 129½ miles of privately-owned railway previous to the war, which were increased during hostilities by a total length of 215 miles, constructed by British forces. In addition to the 100 miles between Swakopmund and Usakos converted to the Union of South Africa standard gauge of 3 feet 6 inches, the Union Railway Administration, on the instructions of the South African government, took over all these railways, but was of the opinion that the lines in question were not likely to be a source of revenue for many years.

The budget for 1915-16, as well as the budget for 1914-15, showed estimated revenue of 47,820,875 marks and estimated expenditure of 47,820,338 marks; estimated local receipts were 28,199,450 marks, imperial contribution, 12,140,013, and loan 7,480,865.

German Southwest Africa was finally conquered by South African forces under Gen. Louis Botha in July, 1915, and is administered by the Union of South Africa.

**GERMANY.** The German Empire is a constitutional monarchy, consisting of 25 federated states and an imperial territory (Reichsland). The capital is Berlin.

**AREA AND POPULATION.** Germany's area is 540,857.5 square kilometers, exclusive of the Baltic and North Sea lagoons and the German part of the Lake of Constance. The equivalent in square miles is 208,825.2, as compared with 207,129 square miles for France and 208,770 square miles for the States of Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, and Ohio. The estimated population June 30, 1914, a month before the outbreak of the great war, was 67,810,000.

The German customs territory (Zollgebiet) includes the grand duchy of Luxemburg and the Austrian communes of Jungholz and Mittelberg and excludes the free port of Hamburg, a part of the commune of Cuxhaven, the territories of the free ports of Bremen, Bremerhaven, and Geestmünde, the island of Helgoland, and several communes of the Grand Duchy of Baden on the Swiss frontier. The area of the customs territory is 543,354 square kilometers, or 209,789 square miles; the estimated population June 30, 1914, was 68,059,000.

The area of the empire in square miles, and the population according to the census of Dec. 1, 1900, and the census of Dec. 1, 1910, are shown by states in the table below (*k* kingdom, *g* grand duchy, *d* duchy, *p* principality, *fc* free city, *r* Reichsland); under Prussia are shown the constituent provinces and the territory of Hohenzollern, and under Bavaria are shown Bavaria proper and the detached Palatinate, which is west of the Rhine.

	Sq. m.	Pop. 1900	Pop. 1910
Anhalt ( <i>d</i> )	887.3	316,085	331,128
Alsace-Lorraine ( <i>r</i> )	5,606.9	1,719,470	1,874,014
Baden ( <i>g</i> )	5,818.6	1,867,944	2,142,838
Bavaria ( <i>k</i> )	29,293.5	6,176,057	6,887,291
Bavaria proper	27,004.7	5,344,379	5,950,206
Palatinate	2,228.5	831,678	937,085
Bremen ( <i>fc</i> )	99.0	224,882	299,526
Brunswick ( <i>d</i> )	1,417.8	464,838	494,839

	Sq. m.	Pop. 1900	Pop. 1910
Hamburg ( <i>fc</i> )	160.0	768,849	1,014,664
Hesse ( <i>g</i> )	2,969.5	1,119,893	1,382,051
Lippe ( <i>p</i> )	469.4	188,952	150,937
Lübeck ( <i>fc</i> )	114.9	96,775	116,599
Mecklenburg-Schwerin ( <i>g</i> )	5,068.3	607,770	639,958
Mecklenburg-Strelitz ( <i>g</i> )	1,131.1	102,602	106,442
Oldenburg ( <i>g</i> )	2,482.3	399,180	483,042
Prussia ( <i>k</i> )	134,663.9	34,472,509	40,165,219
Berlin (city)	24.5	1,888,848	2,071,257
Brandenburg	15,383.1	3,108,554	4,092,616
East Prussia	14,286.5	1,996,626	2,064,175
Hanover	14,868.5	2,590,839	2,942,436
Hesse-Nassau	6,062.5	1,897,981	2,321,021
Hohenzollern (ter.)	441.0	66,780	71,011
Pomerania	11,686.7	1,684,832	1,716,921
Posen	11,193.6	1,887,275	2,099,931
Rhine Province	10,424.8	5,759,798	7,121,140
Saxony	9,755.7	2,832,616	3,089,275
Schleswig-Holstein	7,343.2	1,387,968	1,621,004
Silesia	15,573.4	4,668,857	5,225,962
Westphalia	7,806.8	3,187,777	4,125,096
West Prussia	9,866.7	1,563,658	1,703,474
Reuss Elder Line ( <i>p</i> )	122.1	68,396	72,769
Reuss Younger Line ( <i>p</i> )	319.2	139,220	152,752
Saxe-Altenburg ( <i>d</i> )	511.0	194,914	216,128
Saxe-Coburg-Gotha ( <i>d</i> )	763.2	229,550	257,177
Saxe-Meiningen ( <i>d</i> )	952.8	250,731	278,762
Saxe-Weimar ( <i>g</i> )	1,398.8	362,873	417,149
Saxony ( <i>k</i> )	5,788.8	4,202,216	4,806,661
Schaumburg-Lippe ( <i>p</i> )	131.4	48,182	46,652
Schwartzburg-Rudolstadt ( <i>p</i> )	363.0	93,059	100,702
Schwartzburg-Sondershausen ( <i>p</i> )	332.9	80,898	89,917
Waldeck ( <i>p</i> )	432.8	57,918	61,707
Württemberg ( <i>k</i> )	7,531.8	2,169,480	2,437,574
<b>Total</b>	<b>208,825.2</b>	<b>56,367,178</b>	<b>64,925,993</b>

One hundred years ago (that is, in 1816), the population of the territory now embraced within the empire was 24,833,000. It had increased in 1871, after the Franco-Prussian War, to 41,058,792. From 1871 to 1910, the increase was 58.1 per cent, and from 1900 to 1910 14.1 per cent.

According to the 1910 census, males numbered 32,040,166, and females 32,885,827. In view of the great war, it is interesting to note that the number of males returned by the 1910 census as having been born between the years 1869 and 1896 inclusive, is 11,936,803; that is, this is the number of males who, barring deaths from Dec. 1, 1910, would be from 18 to 45 years of age in 1914.

Foreigners at the 1910 census numbered 1,259,880 (716,889 males, 542,991 females); there were 634,989 Austrians, 144,181 Dutch, 137,668 Russians (including Finns), 104,265 Italians, 68,233 Swiss, 32,087 Hungarians, 26,238 Danes, 19,137 French (including colonials), 18,319 British (including colonials), 17,555 Americans (including Filipinos, Porto Ricans, and Hawaiians), 14,356 Luxembourgish, 13,449 Belgians, and 9671 Swedes.

German population has increased far more rapidly in the urban communes than in the rural communes (a rural commune is one that has less than 2000 inhabitants). In 1871 the rural communes had 63.9 per cent of the population, in 1900 45.6 per cent, and in 1910 40.0 per cent. In 1910 there were 576 communes with over 10,000 inhabitants each, and 48 with over 100,000 each. The aggregate population of the 48 communes was 21.3 per cent of the total population of the country—the population of such communes in 1900 was 16.2 per cent of the total, and in 1871 only 4.8 per cent. The popu-



lation of Berlin Feb. 1, 1916, is reported at 1,928,418. The communal population of the larger cities was returned as follows by the 1910 census: Berlin, 2,071,257; Hamburg, 931,035; Munich, 596,467; Leipzig, 589,850; Dresden, 548,308; Cologne, 516,527; Breslau, 512,105; Frankfurt am Main, 414,576; Düsseldorf, 358,728; Nuremberg, 333,142; Charlottenburg, 305,978; Hanover, 302,375; Essen, 294,653; Chemnitz, 287,807; Stuttgart, 286,218; Magdeburg, 279,629; Bremen, 247,437; Königsberg, 237,289; Neukölln (formerly Rixdorf), 237,289; Stettin, 236,113; Duisburg, 229,483; Dortmund, 214,226; Kiel, 211,627; Mannheim, 193,902; Halle, 180,843; Strassburg, 178,891.

Of the population in 1910, Evangelicals numbered 39,991,421 (61.59 per cent); Roman Catholics, 23,821,453 (36.69); other Christians, 283,946 (0.44); Jews, 615,021 (0.95); others, 214,152.

The birth rate per thousand inhabitants fell from 36.8 in 1900 to 28.3 in 1913, and the death rate from 23.2 to 15.8; stillbirths per hundred births declined from 3.1 to 2.9, and illegitimate births per hundred births increased from 8.7 to 9.7. In 1913, births and deaths numbered 1,894,598 and 1,060,798 respectively (both figures including stillbirths, which numbered 55,848), the excess of births over deaths being 833,800; the excess of births over deaths was 839,887 in 1912, 739,945 in 1911, and 879,113 in 1910.

German overseas emigrants in 1913 numbered 25,843, and foreign emigrants from German ports 413,057; in 1914, 11,803 and 150,416. Of the German emigrants in 1914, 9614 were bound for the United States, 580 for Canada, and 232 for Australia; of the foreign emigrants from German ports, 131,938 were bound for the United States.

**EDUCATION.** The degree of illiteracy in Germany is almost negligible. Elementary instruction is compulsory throughout the Empire, the school age being from 6 to 14. The latest available statistics for elementary and middle schools relate to 1911. In that year, the public elementary schools numbered 61,557, with 187,485 teachers (148,217 male, 39,268 female) and 10,309,949 pupils (5,157,446 males, 5,152,503 female). In addition, there were 480 private elementary schools, with 26,151 pupils (11,894 male, 14,257 female). Middle schools in 1911 numbered 2049, of which 914 were public and 1135 private. The public middle schools had 7531 teachers (5147 male, 2384 female) and 273,394 pupils (135,799 male, 137,595 female); the private middle schools had 4534 teachers (1131 male, 3403 female) and 80,660 pupils (21,873 male, 58,787 female). Total number of pupils in the elementary and middle schools public and private, 10,690,154.

Institutions for secondary, higher, technical, and professional instruction are numerous and highly organized. More recent statistics than those given in the 1915 YEAR BOOK are not available. The great war has interfered with the course of instruction at these institutions, as may be inferred from the fact that the university enrollment declined from 70,024 in the winter semester of 1913-14 to 56,644 in the winter semester of 1914-15.

**AGRICULTURE.** Although German agriculture prior to the great war had reached a high

state of intensive development, it could not meet the demands, except with respect to certain crops, of a dense population that was increasing by some 800,000 a year. For many years the trend of population had been markedly cityward, that is, the urban population had been increasing far more rapidly than the rural. The number of persons supported by agriculture decreased from 18,501,307 in 1895 to 17,681,176 in 1907, while the percentage decreased from about 35.8 to about 28.6.

In 1913, arable land, including gardens, amounted to 26,059,200 hectares (about 48.2 per cent of the area of the country); meadow, 5,991,700 (11.1 per cent); pasture, 2,592,500 (4.8); vineyard, 118,600 (0.2); woodland, 14,223,200 (26.3). Statistics of sowings and harvests later than for 1914 have not been available during the war. According to newspaper reports, the potato yield of 1916 (potatoes and rye are the most important crops) was only about half the normal. In 1913 and 1914, the area in hectares and the yield in metric tons of cereal crops, potatoes, and hay were as follows:

	Hectares		Metric Tons	
	1913	1914	1913	1914
Wheat . . . . .	1,974,098	1,996,100	4,655,956	8,971,995
Rye . . . . .	6,414,143	6,298,956	12,222,894	10,426,718
Barley . . . . .	1,654,020	1,581,999	3,673,254	8,187,988
Oats . . . . .	4,438,209	4,888,146	9,713,965	9,038,185
Spelt . . . . .	272,493	269,135	438,469	370,565
Potatoes . . . . .	3,412,201	3,386,098	54,121,146	45,569,559
Hay . . . . .	5,923,647	5,784,964	29,184,994	29,156,024

For the 10-year period 1903-14, the average yield of wheat per hectare was 20.7 metric quintals; rye, 17.2; barley, 19.8; oats, 19.0; spelt, 14.7; potatoes, 135.1; hay, 43.0. The share of Prussia in the 1914 production was: wheat, 2,521,263 metric tons; rye, 8,098,553; barley, 1,806,704; oats, 6,067,589; spelt, 18,787; potatoes, 33,040,026; hay, 14,011,645.

Live stock as reported for December 1st, with percentage of decrease from 1914 to 1915:

	1913	1914	1915	P.c.
Horses * . . . . .	3,435,283	3,341,627	2.7	
Cattle . . . . .	20,994,344	21,828,783	20,316,948	6.9
Sheep . . . . .	5,520,837	5,471,468	5,073,478	7.3
Goats . . . . .	3,548,384	3,588,414	3,488,296	2.8
Swine . . . . .	25,659,140	25,341,272	17,287,211	31.8

\* Exclusive of horses used in the army.

The following figures relate to December 1st of 1914 and 1915 respectively: cows and heifers above two years old, 11,320,992 and 10,970,009 (decrease 3.1 per cent); bulls and oxen above two years old, 1,579,850 and 1,493,079 (5.5); young stock from three months to two years of age, 6,858,139 and 6,457,093 (5.8); calves under three months, 2,069,802 and 1,396,767 (32.5); swine above one year old, 2,944,036 and 2,353,194 (20.1); swine six months to one year old, 7,701,905 and 5,346,727 (30.6); swine under six months, 14,695,331 and 9,587,290.

The slaughter of live stock in 1913 and 1914 respectively is reported as follows: oxen, 518,244 and 546,330; bulls, 498,138 and 575,761; cows, 1,633,561 and 1,619,932; young cattle over three months old, 879,032 and 889,634; calves up to three months, 4,088,445 and 3,850,263; sheep, 2,092,989 and 1,869,847; goats, 469,798 and 509,488; swine, 17,872,028 and 19,-

441,273; horses, 163,282 and 117,824; dogs, 7356 and 6884.

**FISHERIES.** In 1912 and 1913 respectively, the value of the North Sea catch was 30,984,600 and 34,611,200 marks; Baltic catch, 10,582,100 and 10,378,200; total, 41,566,700 and 44,989,400. See AGRICULTURE.

**MINERALS AND METALS.** German mining and foundry statistics include those of the grand duchy of Luxemburg. The reported coal production in 1915 is reported at 146,712,350 metric tons, as compared with 161,535,224 tons in 1914; lignite, 88,369,554 tons in 1915 and 83,946,906 in 1914. The principal minerals raised in 1913 included the following: coal, 191,511,154 metric tons; lignite, 87,233,084; iron ore, 28,607,903; copper ore, 947,757; zinc ore, 641,549; lead ore, 110,153; rock salt, 1,391,738; potassium salts, 13,306,312.

The reported output of pig iron in 1915 was 13,163,188 tons, as compared with 14,389,547 tons in 1914 and 19,291,920 in 1913; ingot steel production in 1915, 13,163,188 tons, as compared with 14,872,467 in 1914. The following figures show output in 1912, in metric tons: pig iron, 15,220,900; zinc, 313,600; lead, 165,000; copper, 45,000; silver, 895.8; gold, 43.4; tin, 10,600; sulphuric acid, 1,649,700.

**COMMERCE.** The German customs territory is defined above under *Area and Population*, second paragraph. On account of the great war, Germany has not published commercial statistics for any year later than 1913. But it is clear from the returns of other countries that the German overseas trade has shrunk to a negligible amount. Germany's expanding trade before the war may be seen in the tables below. The following shows, in millions of marks, the total foreign commerce, except goods in transit:

Imports:	1910	1911	1912	1913
Merchandise .....	9,585.1	10,880.0	11,572.4	11,654.8
Coin and bullion..	555.0	297.3	827.4	441.8
<b>Total .....</b>	<b>10,090.1</b>	<b>10,677.3</b>	<b>11,899.8</b>	<b>12,096.1</b>
Exports:	1910	1911	1912	1913
Merchandise .....	8,079.7	8,773.9	9,684.2	10,891.8
Coin and bullion..	352.9	118.3	142.9	102.8
<b>Total .....</b>	<b>8,432.6</b>	<b>8,892.2</b>	<b>9,827.1</b>	<b>10,994.6</b>

The special trade, that is, imports for consumption and exports of German produce, has been as follows, in millions of marks:

Imports:	1910	1911	1912	1913
Merchandise .....	8,934.1	9,705.7	10,691.8	10,769.7
Coin and bullion..	875.9	301.3	325.7	436.4
<b>Total .....</b>	<b>9,810.0</b>	<b>10,007.0</b>	<b>11,017.5</b>	<b>11,206.1</b>
Exports:	1910	1911	1912	1913
Merchandise .....	7,474.7	8,106.1	8,956.8	10,097.2
Coin and bullion..	169.5	118.3	142.7	101.4
<b>Total .....</b>	<b>7,644.2</b>	<b>8,224.4</b>	<b>9,099.5</b>	<b>10,198.6</b>

By great classes, imports for consumption and exports of German merchandise were valued as follows, in millions of marks:

	Imports		Exports	
	1912	1913	1912	1913
Raw materials ...	4,823.2	5,008.0	1,882.4	1,518.1
Partly manufac- tured materials .	1,256.8	1,289.0	1,012.9	1,139.4
Manufactures ....	1,410.9	1,478.8	5,768.2	6,896.3

	Imports		Exports	
	1912	1913	1912	1913
Food substances ..	2,944.9	2,759.2	789.4	1,036.0
Live animals ....	256.0	289.7	8.9	7.4
<b>Total .....</b>	<b>10,691.8</b>	<b>10,769.7</b>	<b>8,956.8</b>	<b>10,097.2</b>

In the special trade, imports of merchandise from the United States and exports of merchandise thereto were valued in 1913 at 1711.5 and 713.2 million marks respectively; Russia, 1424.6 and 880.0; United Kingdom, 876.1 and 1438.2; Austria-Hungary, 827.3 and 1104.8; France, 584.2 and 789.9; British India, 541.8 and 150.7; Argentina, 494.5 and 265.9; Belgium, 344.6 and 551.0; Netherlands, 333.0 and 693.5; Italy, 317.7 and 393.5; Australia, 296.1 and 88.5; Brazil, 247.9 and 199.8.

**SHIPPING.** In the German shipping records a vessel is counted as entered and cleared only once for each voyage although it may touch at several ports. In 1913, there were entered at the ports 115,966 vessels, of 34,772,177 tons (registered), and cleared 117,375, of 34,921,806 tons; in 1912, 114,407 vessels, of 32,541,458 tons, entered, and 113,931, of 32,606,653 tons, cleared. The number of steamers entered in 1913 was 76,551, of 31,307,049 tons, and cleared 77,143, of 31,421,344 tons. Of the total in 1913, German vessels entered numbered 89,329, of 21,231,342 tons, and cleared 90,456, of 21,276,587 tons. British vessels entered in 1913, 5285, of 6,178,714 tons; Swedish, 5931, of 2,172,577 tons; Danish, 8101, of 1,703,232 tons; Norwegian, 2184, of 1,356,681 tons; Dutch, 3635, of 1,022,585 tons. Entered at Hamburg in 1913, 14,054 vessels, of 13,141,362 tons, or about 37.8 per cent of the total shipping entered.

The following figures for the merchant marine exclude vessels having a capacity of less than 50 cubic meters (17.65 tons gross). On Jan. 1, 1914, the merchant marine numbered 4935 vessels of 3,320,071 registered tons net, as compared with 4850 vessels of 3,153,724 tons in 1913, and 4658 of 2,859,307 tons in 1910. Of the total in 1914, 2170 were steamers, of 2,832,312 tons. Registered at North Sea ports, 3948 vessels, of 2,988,216 tons, and at Baltic ports 987, of 331,855 tons. Registered at Hamburg, 1466 vessels, of 1,908,279 tons (of which 822, of 1,640,828 tons, steam).

**COMMUNICATIONS.** The total length of railway reported as in operation March 31, 1915, was 64,195 kilometers (39,889 miles), of which 59,518 kilometers were state railway and 4677 kilometers private railway, and 61,977 kilometers normal gauge and 2218 kilometers narrow gauge. The table below shows in kilometers the length of normal and narrow gauge railway belonging to each of the state systems and the length of private railway:

By Systems of	Normal	Narrow	Total
Prussia-Hesse .....	39,576	239	39,815
Bavaria .....	8,333	115	8,448
Saxony .....	2,837	511	3,348
Württemberg .....	2,002	101	2,103
Baden .....	1,826	28	1,854
Mecklenburg .....	1,094	...	1,094
Oldenburg .....	674	...	674
Alsace-Lorraine .....	2,081	80	2,111
Prussia (Royal Military Ry.) ..	71	...	71
<b>Total state ry. ....</b>	<b>58,444</b>	<b>1,074</b>	<b>59,518</b>
<b>Private railway .....</b>	<b>8,538</b>	<b>1,144</b>	<b>4,677</b>
<b>Total railway .....</b>	<b>61,977</b>	<b>2,218</b>	<b>64,195</b>

The official report of the German railways for the financial year ended March 31, 1915, was issued in 1916. This year included the first eight months of the war, and under all heads the receipts diminished, the only item of increase being in the total expenses, which rose, both relatively and absolutely, from 2,490,400,000 marks to 2,513,200,000 marks. For the year they stood at 80.19 per cent of the total receipts, against 70.03 per cent in the previous year.

German state railway system under the leadership of Prussia. Accordingly, before the war and up to 1916, the only imperial railways in the German Empire were those in Alsace-Lorraine, and the only state which had allowed its railways to come under the direct control of Prussia was Hesse, whose lines form a section of the system officially known as the Prussian-Hessian railway administration. During 1916 Prussia proposed that the temporary "imperialization" of the war should be placed on

## GERMAN RAILWAY ACCOUNTS

	1913-14 Marks	1914-15 Marks	Increase or Decrease. Marks
Profit .....	1,065,700,000	621,020,000	- 444,680,000
Percentage .....	5.70	3.20	—
Passenger and luggage receipts, etc. ....	1,017,500,000	837,800,000	- 180,200,000
Passenger receipts .....	957,000,000	788,300,000	- 220,700,000
Military passenger receipts .....	17,800,000	70,000,000	+ 62,200,000
Luggage receipts .....	30,000,000	23,000,000	- 6,400,000
Goods receipts .....	2,286,200,000	2,041,800,000	- 244,400,000
Percentage of total .....	64.16	65.02	—
Total receipts .....	3,556,100,000	3,184,200,000	- 421,900,000
Expenses .....	2,490,400,000	2,513,200,000	+ 822,800,000
Percentage of receipts .....	70.03	80.19	—
		<i>Miles</i>	
Length of line .....		39,143	
German state railways .....		36,315	
Private railways .....		2,206	
Prussian-Hessian railways .....		24,591	

The capital laid out by the owners of the railways amounted to 19,835,300,000 marks, of which 19,464,400,000 marks were debited to the state railways and 370,900,000 marks to the private railways. These work out respectively to \$125,000 per mile and \$42,000 per mile. The total length of the German state railways open for traffic at the end of the year was 36,315 miles, and that of the private railways 2206 miles. The Prussian-Hessian state railways comprised 24,591 miles. Of the German state railways 22,000 miles were worked as main lines, while 23,000 miles were single lines, 15,000 miles double lines, 45 miles triple lines, and 250 miles quadruple lines.

At the end of the financial year the rolling stock comprised 30,633 locomotives, an increase of more than 1100, 20,067 tenders, 67,491 passenger cars, and 719,555 freight and baggage cars. The aggregate outlay for the stock is put at \$1,257,850,000. The cost of construction of the railways is taken as \$5,051,750,000, or \$130,000 per mile.

The receipts from passengers and baggage amounted to 26.66 per cent of the total, while those from freight were 65.02 per cent.

The number of officials and men employed by the ordinary gauge railways during 1913-14 amounted to 764,028 persons, against 786,466 persons for the previous year, or about 20 per mile. In salaries, wages, etc., were paid 1,394,600,000 marks, against 1,351,400,000 marks for the preceding year.

At the beginning of the war, the various German states which control individual railway systems, such as Bavaria and Württemberg, agreed to the "imperialization" of all the railways within the Empire as a war-time measure, and under such conditions they were operated with considerable efficiency. These states from the outset were jealous of Prussian predominance for they had never been willing to participate in Bismarck's dream of an imperial

a permanent basis, but Württemberg lost no time in vetoing the scheme, pointing out that the existing conditions are only for the duration of the war. It was believed that Bavaria, also Saxony and the Palatinate, would make a similar refusal, but that the Berlin government would later attempt to carry through the plan.

Receipts of the Prussian state railways for the transportation of freight in the second year of the war exceeded by 5 per cent the former high record, made in 1913. The receipts in 1915 were \$417,802,800, as compared with \$359,443,800 in 1914, and \$398,032,200 in 1913. Receipts for the transportation of passengers and freight in 1915 exceeded those of the previous year by \$2,620,000. In the first half of 1916 there was a further increase of more than 5 per cent in the revenue from transportation of passengers and freight.

State telegraph lines in 1913 totaled 238,493 kilometers, with 765,327 kilometers of wire and 41,685 offices. In addition to the state telegraphs, there are railway telegraph lines and some private lines; these had 8328 offices in 1913. Post offices in 1913, 41,415. The imperial administration of posts and telegraphs embraces all the German states except Bavaria and Württemberg; these kingdoms operate, under certain limitations, their own postal and telegraph systems. Places (towns, etc.) having telephonic communication, 41,087.

FINANCE. The standard of value is gold. The monetary unit is the mark; its par value is 23.821 cents. For the fiscal year 1917, the estimated ordinary revenue and expenditure of the Empire balanced at 3,659,261,939 marks; extraordinary revenue and expenditure, 99,213,530 and 87,507,853; total, 3,758,475,469 and 3,746,769,792. These estimates are exclusive of war credits and of expenditure on army and navy. Imperial revenue and expenditure in the fiscal year 1913 and the estimates for 1914

(including supplementary estimates), 1915, and 1916 have been as follows, in thousands of marks:

	1913	1914	1915	1916
<b>Revenue:</b>				
Ord. ....	3,194,399	3,405,178	3,323,081	3,323,081
Extr. ....	190,292	10,392,752	10,042,342	20,042,342
<b>Total</b> ..	<b>3,384,691</b>	<b>13,797,930</b>	<b>13,365,423</b>	<b>23,365,423</b>
<b>Expenditure:</b>				
Ord. ....	3,403,034	3,405,178	3,323,081	3,323,081
Extr. ....	117,868	10,392,752	10,042,342	20,042,342
<b>Total</b> ..	<b>3,520,902</b>	<b>13,797,930</b>	<b>13,365,423</b>	<b>23,365,423</b>

The larger sources of estimated ordinary revenue for the fiscal year 1916: general administration of finance (which includes customs, excise, and stamps), 1,701,282,900 marks; posts and telegraphs, 881,569,500; military contribution, 327,740,881; railways, 79,822,732. The larger estimated ordinary expenditures for the same year: service of the imperial debt, 1,273,729,123 marks; post and telegraphs, 784,017,554; military administration, 515,965,111; pensions, 145,316,708; naval administration, 142,116,451; railway administration, 132,090,451; interior, 122,703,851; general administration of finance, 98,078,647. The estimated extraordinary expenditure on account of the great war (to be raised by loans), 10,300,000,000 marks for 1914, 10,000,000,000 marks for 1915, and 20,000,000,000 marks for 1916.

Aside from the expenditure imposed by the war, the expenditures of the constituent states reach an aggregate amount far larger than the imperial expenditure. The estimated ordinary revenue and expenditure of Prussia for the fiscal year 1916 were 4,758,746,629 and 4,561,048,778 marks respectively; the total estimated revenue and expenditure of Prussia balanced at 4,816,363,929 marks.

The interest-bearing debt of the Empire increased from 4,897,225,300 marks on Oct. 1, 1913, to 4,980,394,300 marks on Oct. 1, 1914, and to 26,014,890,900 marks on Oct. 1, 1915. The non-interest-bearing debt in 1913 and 1914 was 280,000,000 marks. On Oct. 1, 1915, there was a debt of 7,482,000,000 marks of treasury bills free of interest. See articles BANKS AND BANKING; FINANCIAL REVIEW.

ARMY. See MILITARY PROGRESS.

NAVY. See NAVAL PROGRESS.

GOVERNMENT. The German Empire is a federation of states under a constitution bearing date of May 4, 1871, and amended March 19, 1888. The executive power is vested in the King of Prussia as German Emperor, who is authorized to conclude treaties, to declare war (if defensive) and peace, and to appoint and receive diplomatic representatives. The Emperor in 1916 was William II, who was born Jan. 27, 1859, and succeeded his father (Emperor Frederick III) June 15, 1888. The heir apparent, or crown prince, is Prince Frederick William, who was born May 6, 1882.

The legislature consists of the Bundesrat, or Federal Council, and the Reichstag. Members of the Bundesrat (61 in number) represent the constituent states and are appointed for each session by their respective governments. Members of the Reichstag represent the German nation and are elected for five years by direct manhood suffrage.

The imperial ministers, or secretaries of state, do not form a ministry responsible to the legislative branch of the government, but act independently of each other under the general supervision of the imperial chancellor. The chancellor, who is also president of the Bundesrat, is the highest official of the Empire; he is appointed by the Emperor without regard to party strength in the Reichstag, and to the Emperor he is directly responsible. The imperial chancellor in 1916 was Theobald von Bethmann-Hollweg (from July 14, 1909, succeeding Prince von Bülow); he is also Prussian prime minister. Imperial secretaries of state in 1916: Foreign affairs, Gottlieb von Jagow, who succeeded Alfred Kiderlen-Waechter, who died Dec. 30, 1912, and was followed in December, 1916, by Dr. Alfred Zimmermann; interior, Karl Helfferich (succeeding Klemens Delbrück in 1916); war, Lieutenant-General von Stein who succeeded Lieutenant-General von Hoffman in October; marine, Admiral Edouard von Capelle (appointed March 16, 1916, in succession to Grand Admiral Alfred von Tirpitz); justice, Hermann Lisco (from Nov. 1, 1909); treasury, Count Siegfried von Roeder (succeeding Karl Helfferich in 1916); posts and telegraphs, Reinhold Kraetke (from 1901); colonies, Wilhelm Solf (from Dec. 20, 1911). See articles COÖPERATION; PRICES.

## HISTORY

THE SOCIALISTS. The majority of the Social Democrats continued firm for the government. Dr. Liebknecht, however, who had so long been prominent as a critic of the war policy, again occasioned difficulty in the Reichstag, during the session of January 11th, by submitting questions as to the state of the inhabitants of the occupied territory, and as to the government's measures in the matter of the state of siege. In answer to the first question the ministerial director declared that the government could not go into particulars before the Reichstag, but that information would be given at the sitting of the budget committee. To the second request the government refused to give the desired information. On January 13th a caucus of the Socialist party voted by 60 to 25 to deprive Liebknecht of his rights of membership on account of his violation of the party decisions. But the number of those who objected were more numerous than these figures indicated because there were 25 absentees, of whom 12 were said to favor his retention. In the same way the patriotic element dominated the party in respect to the course of the party journal *Vorwärts*, which had been censured for its pacifist attitude, and a committee of the party repudiated that journal as its organ. Nevertheless, the newspaper refused to change its policy. Finally, however, there was a split in the party. On March 24th Herr Haase was expelled by the Social Democratic party and at the same time 18 pacifist members left it. There was thus a new pacifist Social Democratic Labor group led by Haase and Ledebour. Liebknecht and Ruhle would have nothing to do with either faction, and there was still another group, about 20 in number, known as the "Hoch-Simon" group, which, while remaining under party discipline, refused to vote the war credits. Thus the war



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**ADOLPH VON BATOCKI**  
Appointed Food Dictator 1916



**ALFRED ZIMMERMANN**  
Foreign Minister



**MAXIMILIAN HARDEN**  
Editor of Die Zukunft



**KARL LIEBKNECHT**  
Socialist Leader

**FOUR PROMINENT FIGURES IN GERMANY, 1916**  
Photographs by Courtesy American Review of Reviews



party among the Social Democrats had only a majority of 70. The protests of the Social Democratic Labor group against the war became more and more vigorous and Dr. Liebknecht's activities went further yet, resulting in his arrest and sentence to 30 days' penal servitude for an inflammatory address at the May Day demonstrations in Berlin. He was charged with attempted high treason, insubordination, and resistance to the authorities. The penalty was the minimum, the court having regarded the political fanaticism of the accused as an extenuation. There were demonstrations of sympathizers in Berlin and elsewhere when the sentence became known. Before Liebknecht's arrest he had attempted to make a speech in the Reichstag on the reasons for Germany's entrance into the war, in the course of which he sought to prove that they were the reasons which the Entente Allies alleged. He was forbidden to make this speech, but it was subsequently published in pamphlet form. One of the charges which Dr. Liebknecht was said to have made against the government was that Austria had been forced by the Potsdam party into the war against the will of the authorities at Vienna and at Budapest. This report caused much scandal in Germany. Dr. Liebknecht had been prominent for his objection to the government during several years. In 1907 he had been tried for high treason in Leipzig on the basis of an anti-militaristic pamphlet which he had published, and was sentenced to eight months in a military prison. In 1912 he had attracted public attention by his attack on the Prussian and Hessian authorities for permitting the Czar to visit Germany, and in 1913 he had accused the German war party of bribery plots in which the Krupps were concerned. During the war he had been one of the most vigorous opponents of militarism.

**ECONOMIC CONDITIONS.** From the press of the Entente Allies, it appeared that Germany was suffering serious privations as a result of the British blockade, and the war measures of finance were declared by British economists to rest on an insecure basis. Among the indications which were said to prove bad economic conditions were the severe regulations as regarded food, the complaints of many journals of the high food prices, the repeated rumors (denied in German sources) of hunger riots, the embargo on all luxuries, and especially the increasing efficiency of the blockade. Also the mark exchange on March 13th had fallen in New York to 73. Trade with the United States was estimated to have fallen off 92 per cent. In the spring reports of bread riots became more frequent. At the same time, the Reichstag and the German public revealed anxiety as to the food situation. The Socialists demanded more vigorous administrative regulation and measures for the restriction of speculation and extravagance.

**THE FOOD DICTATORSHIP.** On May 23rd it was announced that what amounted to a food dictatorship had been created. The first to hold the office was Herr von Batocki, who was appointed chairman of a food regulation board with wide discretionary powers as to the regulation of the supply, consumption, and sale of food. At the same time the government declared that adequate measures had been taken for the nourishment of the people, and that the

appointment of a food dictatorship was due solely to the scarcity of meats, and to the bad crops of 1915. In June there were frequent reports of food difficulties. Riots in Munich and Essen in which women took part were reported. They were said to have raided the shops where food was sold. Among the first measures of the new administrator were the establishment of soup kitchens in the large centres and the introduction of meat cards. After investigating the situation as regards the food supply he announced that while the prospect for the supply of potatoes was unfavorable, there was still sufficient wheat. He also issued an order that the eating of meat must cease for eight weeks. In regard to the supply of potatoes it was reported at the close of the year that the crop was only two-fifths of that harvested the year before and that there had been as serious a falling off in quality as in quantity. It was impossible to obtain exact details in regard to the scarcity of provisions, but reports and rumors indicated toward the close of the year that conditions were becoming more serious. According to the *Tägliche Rundschau* of Berlin, there had been a great scarcity of bread for weeks and also a scarcity of potatoes, and this despite the fact that the cereal crops were better in 1916 than in the year before. Fish, which had latterly become an important article of diet everywhere, was growing so costly that the greater part of the population had to give it up. Smoked fish cost six times as much as before the war and there was no fresh fish to be had. The same journal went on to say that the harvest of vegetables in Germany, especially in Berlin, had been very abundant. Yet in almost all quarters of the city all kinds of vegetables had disappeared; only potatoes were offered for sale, and their price was constantly increasing. The official explanation was the lack of means of cartage. From sources hostile to Germany many similar indications were cited, especially in French and English journals which published many notes of prisoners complaining of the scarcity of food.

**CIVIL MOBILIZATION.** The systematic direction of industries in war time, already carried further in Germany than in any other belligerent country, was advanced toward the end of the year by some very radical measures, especially by the Patriotic Auxiliary Service Law passed by the Reichstag on December 2nd. In general, the new methods looked to the centralization of all classes of work that had any relation to the war. There was, it was said, no scarcity of raw materials, but it was necessary to control absolutely the labor required for their manufacture. Methods analogous to those employed in the army were applied to the industrial forces of the country, which became in effect a military organization.

The main features of the Patriotic Auxiliary Service Law were as follows: All German males between 16 and 60 years of age not yet called to the colors were subject to patriotic auxiliary service, that is to say, to service in war industries, agriculture, nursing the sick, in short, in any occupation or undertaking directly or indirectly concerned with the conduct of the war. The new service was under the War Office in the Prussian Ministry of War. Provisions for the carrying out of the act were to be issued by the Federal Council and it was to be

enforced under pain of fine or imprisonment. The control was entirely in military hands. Appeals were to be heard by a central committee consisting of two officials of the War Office, two appointed by the imperial government, and one chosen by the state whose subject was concerned. It was announced that at first as a rule the authorities would rely on a call for volunteers, but if the results were inadequate compulsory written calls would be issued. The law was to go into effect at once and to remain in force at the will of the Federal Council. General Gröner was placed in charge of the work. Under him were two chiefs of staff, a military chief and a technical chief, the latter being the well-known industrial magnate, Dr. Kurt Sorge, of Magdeburg. Under them in turn were sections corresponding to the respective branches of industry: metallurgical, mines, chemical, powder-manufacturing, agricultural, and labor. Manual labor was to be equitably apportioned and delegates were to represent the working-men. The War Office was represented in the provinces by several branches, for example, at Düsseldorf for the Westphalian Rhine basin, and at Metz for Lorraine and Luxemburg.

In the debate on the Patriotic Auxiliary Service bill the Socialist proposal of permanent workmen's committees for industrial establishments and railways had been rejected. In the discussion Socialist speeches attacked the government for its course in deporting Belgian workmen (see *BELGIUM, History*).

**PEACE DISCUSSION.** The opposition of certain groups among the Socialists is noted above. Many of them were bitterly opposed to the annexation of territory. On the other hand, the extreme war party demanded that all conquered territory should be annexed. Chancellor Bethmann-Hollweg chose the middle ground between these extremists, saying in his speech of April that while Poland, Lithuania, and Livonia should be taken from Russia, European questions in general should be settled peacefully after the war. Later he reproached the Entente Allies for rejecting peace. In the course of his address he incidentally promised that the censorship would be relaxed. The Chancellor's attitude met with the hearty approval of the patriotic Socialists, the Progressives, the Centre, and the moderate groups in general. On June 20th the Social Democrat Scheidemann declared that the Chancellor had said that he disapproved the plans for annexing Belgium and Northern France, whereupon the Pan-Germans protested against too easy peace terms. A National Committee, was formed in July in the interest of honorable peace on moderate terms. This was under the nominal leadership of Count von Wedel. The Chancellor showed the same moderate attitude toward the submarine controversy, in which he insisted on maintaining friendly terms with the United States in spite of the angry demands of the Conservatives and National Liberals. The retirement of Grand-Admiral von Tirpitz March 16th was taken as a proof of this moderate policy. The latter was succeeded as secretary of state for the navy by Vice-Admiral Eduard von Capelle.

The motives of the German government in its move for peace at the close of the year (see *WAR OF THE NATIONS*) are indicated by a letter of the Kaiser addressed to his Chancellor

on Oct. 21, 1916, in which he said: "Since I have seen you, I have gone over our conversation in my mind. It is clear that the people in enemy countries who have been led to endure the sufferings of war by means of lies and deceit, and who are misled by the struggle and by hate, have no one who is able or who has the moral courage to pronounce the necessary words to propose peace. What is needed is a noble, moral initiative that will deliver the entire world, including the neutrals, of the terrible weight that is crushing down us all. For this act there is need of a sovereign who has a conscience, who feels his responsibility before God, and whose heart beats for his people and for those who are his enemies, who is indifferent to malicious interpretation of his acts, and who has the will to deliver the world from these sufferings. I possess this courage. Trusting in God, I shall venture to take this step. Recast the notes in this sense and submit them to me. Make without delay all the necessary preparations."

**PROMISE OF POLISH AUTONOMY.** On November 5th Governor-General von Beseler read to Polish representatives assembled at the Royal Palace at Warsaw, a manifesto declaring that the Emperors of Germany and Austria-Hungary had agreed to form out of the districts conquered from Russia a national state with a hereditary monarchy and constitutional government. The exact frontiers were to be defined later. The new state was to have a national army whose command would be arranged later by common agreement. In his address after reading this proclamation the Governor-General expressed the hope that soon a Polish army would be fighting on the side of the Central Powers. The Emperor Francis Joseph announced his agreement to this promise in a letter addressed to the Austrian Premier, in which he said that upon the formation of the new state Galicia should also have the right to self-government so far as it was consistent with its status as a part of the Austro-Hungarian commonwealth. The promise of Polish independence was regarded by the Entente Allies as a mere maneuver to secure further recruits among the Poles. It was said that Germany hoped to raise an army of 500,000 men by this measure. A large number of the Poles themselves were suspicious, and leading Poles considered the measure unsatisfactory even if carried out, demanding an independent and united Polish state made up of the Polish parts of Austria, Germany, and Russia. On the other hand, German authorities declared the promise to be a "solemn and irrevocable guarantee." See *WAR OF THE NATIONS*.

**WAR FINANCE.** War appropriations at the close of the preceding year had risen to about 40,000,000,000 marks. The payments on the third war loan were completed in January, making a total of 12,160,000,000 marks. In the same month a fourth loan was issued, to which more than 5,000,000 subscribed, soon bringing the amount to 10,712,000,000 marks. Germany also made loans to her allies. At the close of the preceding year the Finance Minister announced that a war profit tax would be levied upon gains from January, 1914 to 1917, and any one whose profits had been increased by the war was required to hold back 50 per cent for the payment of the tax. In spite of the finan-



cial strain upon the country, the Reichstag on January 11th voted for the reduction for old age pensions from 70 to 65 years. For a general summary of war finance measures during the year, see article FINANCIAL REVIEW.

**OTHER EVENTS.** On January 13th the Prussian Landtag was opened. In his address the Chancellor promised electoral reform, but said that it must be deferred until the end of the war. The question of equal wages for women arose in Schöneberg, where the rate of payment for the women street sweepers was lower than that formerly paid to the men. A Socialist alderman having objected to the action of the Schöneberg common council on the ground that women should have the same pay as men, the mayor contended that the salaries of women should remain unequal, because otherwise the increase would extend all along the line; men would demand more money and refuse to work for the same pay as women. During 1916 the policy of Maximilian Harden's journal, the *Zukunft*, in criticising the war and offering suggestion continued to be the subject of important remark. His articles were widely quoted in the press. In February, commenting on the prospects of peace, he declared that the conditions had changed within six months. At that date, said he, the Germans would have been contented with a defensive policy and with a retention of what they had won. Now, however, the danger of defensive policy was, he thought, evident, for it would give the enemy a chance to learn the secrets of German economic war policy in the first place, and in the second place, German supplies were likely to run out. Delay for Germany therefore was dangerous. What she demanded was a peace on an enduring basis—one that would not involve the loss of honor to her enemies or bar the way to gradual reconciliation. His journal again attracted much attention in the hostile press toward the close of the year by its contention that the promise to Poland (see above) was not binding and of no importance, as not bearing the Chancellor's signature.

For the discussion of the two points of view in regard to the Belgian deportations and the deportations in the north of France, see BELGIUM and FRANCE, paragraphs on *History*. See also CHEMISTRY, INDUSTRIAL; GERMAN PROTECTORATES; PRICES; SOCIALISM; TARIFF; UNITED STATES; WAR OF THE NATIONS, and articles on each of the belligerent Powers. See also GREECE.

**GERNSHEIM, FRIEDRICH.** A German composer, died in Berlin, Sept. 17, 1916. He was born in 1839 at Worms, studied at Mainz, Frankfurt, Leipzig, and Paris, and was a conductor successively at Saarbrücken, Cologne, and Rotterdam. Later he was conductor of an important singing society, the Stern Choral Society, of Berlin (1890-1904). During part of this time he also taught at Stern's Conservatory. Gernsheim is known for four symphonies, an overture, several concertos, choral works, and much chamber music.

**GEROULD, KATHERINE FULLERTON.** See LITERATURE, ENGLISH AND AMERICAN, *Travel*, American.

**GERRY, PETER GOELET.** Elected Democratic United States Senator from Rhode Island, Nov. 7, 1916.

**GIBRALTAR.** A narrow peninsula extend-

ing southward from the southwest coast of Spain; a British crown colony and naval and coaling station. Area, 1½ square miles; population, exclusive of the military, 18,448 in 1912. Practically a free port, it has no trade returns. Revenue (1914), £89,721; expenditure, £121,420; total tonnage entered and cleared, 12,213,230 (7,976,336 British). The customs revenue in 1914 was £32,564.

**GIBSON, WILFRID WILSON.** See LITERATURE, ENGLISH AND AMERICAN, *Poetry*, English.

**GIFTS AND BEQUESTS.** The following list of gifts and bequests made during 1916 is compiled from the table prepared annually by the *Chicago Daily Tribune*. The total amount of donations and bequests to charity, educational and religious institutions, art, music, and the public welfare in general in the United States during 1916 probably reached nearly \$1,000,000,000. Swelling this grand total were the large sums raised by Americans for relief to war sufferers. It is estimated that nearly \$45,000,000 was sent through the principal agencies in New York and Boston during the year, and in addition there were contributions sent through other agencies in various parts of the country, and numerous contributions which were made direct and not through any special fund. In addition to these donations supplies worth millions of dollars were collected. Of these war gifts Belgium received about \$11,000,000; France, nearly \$4,000,000; Germany, about \$9,000,000; Poland, \$2,300,000; England, \$1,125,000; Jewish relief, \$6,500,000; Serbia, \$320,000; Russia, \$160,000; Armenians and Syrians, \$2,665,000; Balkans, \$500,000, with smaller sums sent to other countries. These sums represent those sent by the Red Cross and larger relief organizations.

The increases by corporations to employees in wages and bonuses amounted to nearly \$400,000,000. Christmas charitable organizations and Good Fellows added about \$80,000,000 to the grand total.

The individuals giving the largest sums during the year were John D. Rockefeller, Andrew Carnegie, Julius Rosenwald, and Mrs. Russell Sage. Mr. Rockefeller's private donations amounted to \$9,500,000, Mr. Carnegie's to \$3,000,000, Mr. Rosenwald's to \$1,600,000, and Mrs. Russell Sage's to \$525,000.

The donations and bequests for various purposes amounted to \$764,077,779. These include only large sums which have been publicly announced. Of this total, donations amounted to \$623,262,002, and bequests to \$140,815,797. To charities were given \$657,042,700, to educational institutions, \$72,612,619; to religious institutions, \$20,243,735, to museums, art galleries, and municipal benefits, \$11,479,295, and to libraries, \$2,717,450.

Among the notable bequests and gifts made by women, were: Lizzie M. Palmer, Detroit, Mich., \$3,000,000; Lyra B. Nickerson, Providence, R. I., \$3,000,000; Mrs. D. W. James, New York City, \$2,550,000; Margaret H. W. Watson, Pittsburgh, Pa., \$2,500,000.

This list mentions only those gifts whose value was \$5000 or over. We are indebted for it to the courtesy of the *Chicago Tribune*.

Achells, Fritz, New York, gift to Red Cross base hospital, \$25,000.

Actors' Fund, gift by Moving Picture Industries, \$300,000; by various donors, \$9000.

- Aikoa, S. C., gift to hospital by various donors, \$37,500.
- Alexander, La., gift to hospital by various donors, \$50,000.
- Allen, B. C., Colorado Springs, Col., gift to University of Pennsylvania, \$10,000.
- Allen, Dudley F., New York, will to Oberlin College, \$100,000.
- American Bible Society, will by Henry Dexter, \$258,986.
- American College of Surgeons, Boston, Mass., gift by various donors, \$500,000.
- American Museum of Natural History, gift by Helen C. Juilliard, \$50,000.
- American University, gift by Hart A. Massey, \$50,000.
- Amherst College, gift by various donors, \$180,500.
- Amherst College Library, gift of Edward C. Converse, \$250,000.
- Anderson, Elizabeth M., New York, gift to settlement work, \$100,000.
- Andress, Charles, Chicago, Ill., gift of park to Great Bend, Kan., \$40,000.
- Andrews, Martha, New York, will to Berea College, \$40,000; to charity, \$400,000; to Hampton Institute, \$50,000; to Tuskegee Institute, \$50,000; to charitable and religious institutions, \$1,875,000.
- Andrus, John E., Yonkers, New York, gift to church, \$50,000.
- Anshutz, Louis W., Philadelphia, Pa., will to hospitals, \$10,000.
- Appleton, F. H., gift to Bowdoin College, \$10,000.
- Appleton, Helen R., will to charity, \$6000.
- Arizona, University of, gift by R. H. von Kleinsmid, \$60,000.
- Armenian Relief Fund, gift by Rockefeller Foundation, \$50,000.
- Armour, J. Ogden, Chicago, Ill., gift to Armour Institute, \$500,000; to St. Luke's Hospital, \$100,000.
- Armour Institute, gift by J. Ogden Armour, \$500,000.
- Armstrong, W. H. H., New York, will to church, \$20,000.
- Art Society's School, Hartford, Conn., gift by various donors, \$15,000.
- Associated Charities, San Francisco, Cal., gift by various donors, \$25,000.
- Association for Study of Tuberculosis, gift by Metropolitan Life Insurance Co., \$100,000.
- Athens College, gift by Mrs. T. T. Hillman, \$5000; by various donors, \$120,000.
- Auburn, N. Y., gift to hospital by various donors, \$100,000.
- Auburn Theological Seminary, gift by various donors, \$280,000.
- Augusta, Ga., gift to fire sufferers by various donors, \$50,000; to fire sufferers by Shriners, Reno, Nev., \$50,000.
- Auld, Thomas L., Lincoln, Neb., gift of park to city, \$10,000.
- Austin, Charles L., Portsmouth, N. H., will to charity, \$100,000.
- Avery, Mary A., San Francisco, Cal., will to hospital, \$120,000.
- Bailey, Sarah L., Dillsburg, Pa., will to charity, \$40,000.
- Baker, George F., New York, gift to Cornell University, \$50,000; to Metropolitan Museum, \$105,000.
- Baldwin, F. H., Boston, Mass., will to Cincinnati University, \$500,000.
- Baltimore, Md., gift to charity by various donors, \$75,000.
- Baptist Institute, Philadelphia, Pa., gift by unnamed donors, \$25,000.
- Barber, O. C., Barberton, O., gift to Western Reserve University, \$8,000,000.
- Barker, James, Englewood, N. J., gift to church, \$100,000.
- Barnard College, gift by various donors, \$5000.
- Barnes, Adaline, Ithaca, N. Y., will to charity, \$5000.
- Barnest, Nathan, Paterson, N. J., gift of hospital to city, \$150,000.
- Barney, Everett H., Springfield, Mass., will to city, \$600,000.
- Barrick, David H., Philadelphia, Pa., will to charity, \$70,000.
- Bates College, gift by unnamed donors, \$37,000.
- Battelle, J. G., Columbus, O., gift to Children's Hospital, \$5000.
- Belgian relief, gift by Rockefeller Foundation, \$200,000.
- Beloit College, will by Lucius G. Fisher, \$5000.
- Benedict, Maria, New York, will to charity, \$10,000.
- Bennington Street Hospital, gift by H. W. Putnam, \$90,000.
- Bennum, P. P., Champaign, Ill., gift to Eureka College, \$50,000.
- Benton Harbor, Mich., gift by unnamed donor to aged preachers, \$12,000.
- Berea College, gift by Mrs. D. W. James, \$40,000; gift by James Talcott, \$10,000; will by Martha Andrew, \$40,000.
- Bethel Home, gift by various donors of Duluth, Minn., \$30,000.
- Biederwolf, W. C., Winona, Ind., gift to Winona Federated Schools, \$20,000.
- Bierstadt, Mary S., New York, will to charity, \$40,000; to church, \$15,000.
- Birmingham, Michael, New York, will to charity, \$13,000.
- Black, Emma L. T., New York, will to public library, \$200,000.
- Bliss, Cornelius N., New York, gift to charity, \$4,500,000.
- Bliss, Katharine A., New York, will to church, \$20,000.
- Bondy, Emil C., New York, will to charity, \$96,200; to church, \$10,000; to Columbia University, \$100,000; to Metropolitan Museum, \$35,095.
- Booth, Angie M., Great Neck, L. I., gift to hospital, \$25,000.
- Boston Museum of Fine Arts, gift by various donors, \$259,000.
- Boston Universal School of Medicine, gift by R. R. Robinson, \$50,000.
- Bowdoin College, gift by F. H. Appleton, \$10,000; by Mrs. W. Coe, \$27,000.
- Bowman, J. R., Chicago, Ill., gift to church, \$5000.
- Boys' Club, Pittsburgh, Pa., gift by unnamed donor, \$15,000.
- Boys' Club House, New York, gift by various donors, \$110,000.
- Brandeis, Arthur F., Omaha, Neb., will to charity, \$10,000.
- Brandeis, Louis D., Washington, D. C., gift to Zionist movement, \$6000.
- Breaux, Joseph E., New Orleans, La., gift to charity, \$8000.
- Brett, Clare J. D., Westerville, O., will to charity, \$5000.
- Brookhaven, Miss., gift to church by various donors, \$6000.
- Brooklyn, N. Y., hospital, gift by various donors, \$50,000.
- Brown, Caroline, New Albany, Ind., will to church, \$10,000.
- Brown, Fannie, Philadelphia, Pa., will to charity, \$15,500.
- Brown, W. P., New York, will to charity, \$20,000.
- Brown University, will by Sarah C. Durfee, \$5000; will by R. H. I. Goddard, \$22,000; will by Ghan Hess, \$100,000; gift by unnamed donor, \$100,000.
- Browne, Catherine E., New York, will to charity, \$6000.
- Brown, T. Wistar, Philadelphia, Pa., will to Haverford College, \$409,321.
- Bryn Mawr College, will by George W. Kenrick, \$5000.
- Buck, Martha A., Decatur, Ill., gift to Wesleyan University, \$200,000.
- Bultner, Charles, Orange, N. J., will to hospital, \$5500.
- Burke, Sophia L., Detroit, Mich., gift to charity, \$50,000.
- Burkholder, E. R., McPherson, Kan., gift to Southwestern University, \$10,000.
- Burr, Harriet K., Ironton, O., will to charity, \$35,000.
- Burrows, George T., Louisville, Ky., will to University of Wisconsin, \$250,000.
- Burt, A. E., Houston, Texas, gift to sanitarium, \$50,000.
- Burt, Mr. and Mrs. R. E., Waco, Texas, gift to hospital, \$150,000.
- Bussing, John F., New York, will to church, \$18,000.
- Butler, James G., St. Louis, Mo., gift to Lindenwood College, \$200,000; will to charity, \$500,000; will to Lindenwood Female College, \$50,000; will to Westminster College, \$25,000.
- Butler, Joseph G., Youngstown, O., gift to Humane Society, \$10,000.
- Calef, Ira C., Washington, Vt., gift to charity, \$76,000; to Goddard Seminary, \$10,000.
- California, University of, gift of exhibits by Japanese Exposition Commission, \$70,000; by Mr. and Mrs. George H. Howison, \$70,000; by various donors, \$200,000; by Horace Whittaker, \$250,000; will by Horace Davis, \$10,000.
- Calman, Emma, New York, will to charity, \$6250.
- Canadian relief fund, gift by J. P. Morgan, \$20,000.
- Caplis, Michael, Detroit, Mich., will to church, \$300,000.
- Carnegie, Andrew, gift to charity, \$50,000; to Chattanooga University, \$30,000; to Phillips Exeter Academy, \$45,000; to Union College, \$5000; to library, Athol, Manitoba, \$22,000; gift of library to Bismarck, Mont., \$25,000; gift of library to Duquoin, Ill., \$16,000; gifts of library to Evansville, Ind., \$10,000; gift

of library to Exeter, Cal., \$5000; gift of library to Kingston, N. C., \$6000; gift of library to Laporte, Ind., \$21,700; gift of library to Marion, Ill., \$18,000; gift of library to Oakdale, Cal., \$10,000; gift of library to Plattsmouth, Neb., \$12,500; gift of library to Pulaaki, N. Y., \$6000; gift of library to Reading, Mass., \$15,000; gift of library to Vincennes, Ind., \$30,000.  
 Carnegie, Mrs. Andrew, gift to charity, \$50,000.  
 Carnegie Corporation, gift to Carnegie Institute, \$1,038,500.  
 Carnegie Foundation, gift to charity, \$687,000.  
 Carnegie Institute, gift by Carnegie Corporation, \$1,038,500.  
 Carpenter, Mary W., Pittsfield, Mass., will to charity, \$8000.  
 Carrier, Elisabeth K., Pittsburgh, Pa., will to charity, \$5900.  
 Carroll College, Waukesha, Wis., gift by various donors, \$92,000.  
 Carson, Robert, Philadelphia, Pa., will for Orphan Girls' College, \$5,000,000.  
 Carter, William S., Lebanon, N. H., gift to community building, \$50,000.  
 Chaffee, Bertrand, Springfield, N. Y., will to charity, \$45,000.  
 Channing, Elisabeth P., Milton, Mass., will to charity, \$5000.  
 Channing, Ellen, Milton, Mass., will to charity, \$5500.  
 Channing, E. H., New York, will to charity, \$25,000.  
 Chapman, Henry S., Montclair, N. J., gift of library to city, \$50,000.  
 Charity Ball, New York, \$10,000.  
 Chase, Lucy D. M., New York, will to charity, \$20,000.  
 Chattanooga University, gift by Andrew Carnegie, \$30,000; by Rockefeller Foundation, \$81,000; by various donors, \$139,000.  
 Cheney, Charles E., Chicago, Ill., \$15,000.  
 Chicago Boys' Club, will by William H. Jones, \$100,000.  
 Chicago, Ill., gift to church by various donors, \$258,950; for equipment and armory purposes by unnamed donor, \$250,000; to woman's club by unnamed donors, \$10,000, to Church Home for Aged Persons by various donors, \$101,000.  
 Chicago, University of, gift by Mrs. George B. Eckels, \$10,000; by General Education Board, for medical school, \$1,000,000; by La Verne W. Noyes, \$190,000; by Rockefeller Foundation, \$1,000,000; by various donors, \$1,000,000; by Mr. and Mrs. Julius Rosenwald, \$500,000; by Hobart Williams, \$2,500,000.  
 Chicago, University of, Medical School, gifts by Fred. H. Rawson, \$300,000; by Charles H. Ruddock, \$200,000; by Martin A. Ryerson, \$250,000; by unnamed donors, \$500,000.  
 Chicago Presbyterian Hospital, will by James Longley, \$150,000.  
 Chicago Symphony Association, will by Bryan Lathrop, \$100,000.  
 Chicago Symphony Orchestra, will by Bryan Lathrop, \$60,000.  
 Child's Home Bureau, New York, gift by various donors, \$120,000.  
 Children's Home, gift by Mr. and Mrs. S. S. Deemer, \$100,000.  
 Children's Home Society, Detroit, Mich., gift by various donors, \$10,000.  
 Children's Hospital, Columbus, Ohio, gift by J. G. Battelle, \$5000.  
 Children's Hospital, Milwaukee, Wis., gift by Mr. and Mrs. Ferdinand Schlesinger, \$150,000.  
 Children's Hospital, Philadelphia, Pa., gift by unnamed donor, \$5000.  
 Children's Tag Day, Chicago, Ill., \$50,000.  
 Christian and Mission Alliance, N. Y., gift by various donors, \$46,000.  
 Christian Science Church, gift for sanitarium, \$1,000,000.  
 Christmas Clubs and Good Fellows in United States, \$80,000,000.  
 Church Home for Aged Persons, Chicago, Ill., gift by various donors, \$101,000.  
 Cincinnati University, will by F. H. Baldwin, \$500,000.  
 Clark, B. C., Martin, Texas, will to schools, \$10,000.  
 Clark, George M., Hartford, Conn., will to church, \$16,300.  
 Clark, W. A., Los Angeles, Cal., gift to charity, \$2,000,000.  
 Clarke, Elisabeth L., Roxborough, Pa., will to Orphans' Home, \$68,025.  
 Clay, Albert A., Cleveland, O., will to church, \$20,000.  
 Cleveland, O., gift to church by various donors, \$90,000.  
 Cleveland Art Museum, gift by Mary Harkness, \$100,000.  
 Claws, Henry, New York, gift to charity, \$25,000.  
 Close, Edward B., New York, gift to charity, \$50,000.

Coe, Mrs. W., Bangor, Me., gift to Bowdoin College, \$27,000.  
 Cohen, Martha R., Passaic, N. J., will to church, \$5000.  
 Colby College, gift by R. C. Shannon, \$125,000.  
 Coldwater, Mich., gift by unnamed donors to Industrial Home, \$8000.  
 College of City of New York, gift by various donors, \$150,000.  
 Collins, John, Memphis, Tenn., will to charity, \$20,000.  
 Colorado College, gift by Helen C. Juilliard, \$50,000.  
 Columbia University, gift by E. O. Bondy, \$100,000; by James N. Jarvis, \$100,000; by various donors, \$681,118; will by Alice F. T. Wheelock, \$5000.  
 Columbian World's Fair Fund to School of Domestic Arts and Sciences, \$100,000.  
 Columbus, O., gift to charity by various donors, \$45,000.  
 Community Trust Company, Chicago, gift to United Charities, \$5000.  
 Conchita College, will by Florence J. Wilson, \$20,000.  
 Conohan, H. B., Wilkes-Barre, Pa., will to charity, \$8300.  
 Cook, Mary A., Hartford, Conn., will to church, \$17,000.  
 Cooley, G. R., Hartford, Conn., gift to Y. W. C. A., \$10,000.  
 Coolidge, Elizabeth S., Pittsfield, Mass., second gift to Chicago Orchestra, \$100,000.  
 Coos Estate, Benson, Neb., gift to orphan asylum, \$30,000.  
 Cornell University, gift by George F. Baker, \$50,000; by unnamed donors, \$185,000.  
 Cornelson, George H., Orangeburg, S. C., will to Presbyterian College of S. C., \$5000.  
 Cottrell, Ella H., New Brunswick, N. J., will to church, \$6500.  
 Cox, Sarah S., Philadelphia, Pa., will to charity, \$15,000.  
 Coxe, Eckley B., Drifton, Pa., will to University of Pennsylvania, \$600,000; to charity, \$380,000; to Mining and Mechanic Institute, Freeland, Pa., \$25,000.  
 Cramer, Deborah K., Charleston, S. C., will to charity, \$5000.  
 Crane, Louise F., Boston, Mass., will to charity, \$35,000; to church, \$80,000; to Holyoke College, \$5,000.  
 Crane, R. F., Chicago, Ill., gift to cure infantile paralysis, \$25,000.  
 Creamer, Adeline M., New York, will to charity, \$30,000.  
 Creed, Mrs. M. A., Gardner, Mass., gift to church, \$5000.  
 Crippled Children, New York, gift by various donors, \$50,000.  
 Crippled Children's Hospital, gift by Elise A. Drexler, \$1,000,000.  
 Crocker, William H., San Francisco, Cal., gift to working girls' home, \$10,000.  
 Crozer, Mrs. J. L., Chester, Pa., gift to Homeopathic Hospital, \$28,000.  
 Cudahy, Misses Mary and Clara, Chicago, Ill., gift to church, \$500,000.  
 Cunningham, Isabella, Boston, Mass., will to charity, \$5000.  
 Cupp, Charles M., Eaton Rapids, Mich., will to charity, \$7000.  
 Cupp, William C., Charlotte, Mich., will to charity, \$7000.  
 Cupp, W. C., Eaton Rapids, Mich., will to State Industrial School for Girls, \$7000.  
 Cushing, C. L., Boston, Mass., will to charity, \$5500.  
 Cushing, Jane M., Boston, Mass., will to charity, \$35,000.  
 Cutney, Jessie W., Pottsville, Pa., will to church, \$10,000.  
 Dabney, Stella B., New York, gift to charity, \$5000.  
 Dailey, Lydia, Dillsburg, Pa., will to charity, \$40,000.  
 Danbury Hatters' relief fund, New York, gift by various donors, \$450,000.  
 Dartmouth College, gift by W. F. Robinson, \$75,000; by other donors, \$125,000; by E. M. Topliff, \$200,000.  
 Davies, Emeline C., New York, will to church, \$26,000.  
 Davis and Elkins College, will by Henry G. Davis, \$100,000.  
 Davis, Henry G., Elkins, W. Va., will to charity, \$70,000; will to church, \$15,000; will to Davis and Elkins College, \$100,000.  
 Davis, Horace, San Francisco, Cal., will to charity, \$70,000; to Harvard University, \$10,000; to Leland Stanford University, \$10,000; to University of California, \$10,000.  
 Davis, M. C., Sioux City, Iowa, gift to hospital, \$100,000.  
 Dawes, Charles G., Chicago, Ill., gift for women's hotel, \$100,000.

- Deemer, Mr. and Mrs. S. S., Newcastle, Del., gift to Children's Home, \$100,000.
- Dearing, Mrs. J. W., Boston, Mass., will to charity, \$10,000.
- De Jonghe, Josephine, Chicago, Ill., will to charity, \$180,000.
- Delaware College, gift by unnamed donors, \$1,200,000.
- Demham, Henry, San Francisco, Cal., will to charity, \$8000.
- Denison University, gift by various donors, \$500,000.
- De Pauw University, gift by Edward Rector, \$100,000; by various donors, \$144,000; will by Bascom O'Hair, \$25,000.
- De Puy, Doretta G., New York, will to charity, \$100,000.
- Deshon, Caroline E., New York, will to church, \$20,000.
- Des Moines Women's Foreign Mission Society, gift to missions, \$110,000.
- Dexter, Henry, New York, will to American Bible Society, \$258,936; to Salvation Army, \$208,936; to Y. M. C. A., \$258,936.
- Diagnostic Hospital, New York, gift by various donors, \$100,000.
- Dibble, Dr. L. B., Kansas City, Mo., gift to Grinnell College, \$100,000.
- Dibert, Mrs. John, New Orleans, La., gift to Tuberculosis Hospital, \$200,000.
- Dick, Harris B., New York, will to Metropolitan Art Museum, \$1,000,000; to charity, \$40,000.
- Diner, Michael, Detroit, Mich., gift to church, \$75,000.
- Dobbs, S. C., Atlanta, Ga., gift to Emory University, \$60,000.
- Dodge, G. M., Council Bluffs, Ia., will to charity, \$50,000; will for library, \$50,000; will to Norwich University, \$50,000.
- Domestic Art School, gift to found by Mrs. Russell Sage, \$250,000.
- Doremus, Mrs. R. P., New York, gift to Washington and Lee College, \$100,000.
- Douglas, Mrs. E. D., Philadelphia, Pa., gift to charity, \$50,000.
- Dows, Kenneth, New York, gift to Johns Hopkins Hospital, \$95,200.
- Drexler, Elise A., Woodside, Cal., gift for Crippled Children's Hospital, \$1,000,000.
- Draw, H. C., Lake Charles, La., will for manual training school, \$100,000.
- Dubuque German College, gift by unnamed donor, \$25,000.
- Dudley, Lucinda, Boston, Mass., will to charity, \$13,000.
- Duke, James B., New York, gift to charity, \$5000.
- Dunnes, Rachel F., Richmond, Me., will to charity, \$9000.
- Durfee, Sarah C., Providence, R. I., will to Brown University, \$5000.
- Earlham College, gift by Hannah A. White, \$5000.
- Eckles, Mrs. George B., Chicago, Ill., gift to University of Chicago, \$10,000.
- Egleston, Thomas, Atlanta, Ga., will to church, \$25,000.
- Elk Lodge, Columbus, Ohio, gift to hospital, \$11,595.
- Elkins, George M., Ogontz, Pa., gift to Memorial Hospital, \$250,000.
- Ellis, W. T., Marysville, Oal., gift of park to city, \$100,000.
- Elyria, Ohio., gift to church by various donors, \$12,600.
- Emery, Mary, Cincinnati, Ohio, gift to church, \$7000.
- Emory University, gift by S. C. Dobbs, \$60,000; by George Windship, \$60,000; by various donors, \$770,951; by other donors, Atlanta, Ga., \$25,000; by unnamed donor, Atlanta, Ga., \$20,000; will by George Windship, \$70,000.
- Engles, Hall, Philadelphia, Pa., will to charity, \$200,000.
- Engles, Paul, Philadelphia, Pa., will to charity, \$100,000.
- Episcopal Church School, gift by Joy Morton, \$25,000.
- Episcopal Ministerial Fund, gift by various donors, \$3,500,000.
- Ethical Society, New York, gift by various donors, \$170,000.
- Eureka College, gift by P. P. Bennum, \$50,000.
- Evanston Hospital, gift by James A. Patten, \$125,000.
- Ewen, Caroline G., New York City, will to charity, \$250,000.
- Excell, E. O., Chicago, Ill., gift to Winona Federated Schools, \$20,000.
- Fels, Mrs. Joseph, Philadelphia, Pa., gift to Zionst Movement, \$1,000,000.
- Fenn, Mary L., Portland, Me., will to charity, \$15,000.
- Ferinev, F. N., Milwaukee, Wis., will to Oberlin College, \$112,500; to public library, \$56,250; to charity, \$56,250.
- Field, Stanley, Chicago, Ill., gift of pension fund to Field Museum, \$150,000; gift to Field Museum, \$8000.
- Field Museum, gift of pension fund by Stanley Field, \$150,000; gift by Stanley Field, \$8000.
- Firestone Auto Co., Worcester, Mass., pension and welfare fund, \$1,000,000.
- Fischer, Carl G., Indianapolis, Ind., gift to girls' home, \$100,000.
- Fisher, Lucius G., Chicago, Ill., will to Beloit College, \$5000.
- Flake, Marie A., Pasadena, Cal., will to Princeton University, \$115,000.
- Fitzgibbons, John, gift of hospital to Marshall, Mo., \$100,000.
- Flaherty, James, Atlantic City, N. J., will to church, \$100,000.
- Flaherty, Mrs. James, May's Landing, N. J., will to church, \$100,000.
- Flaherty, Mary E., Philadelphia, Pa., will to charity, \$49,500.
- Fletcher, Harriet, Brattleboro, Vt., will to Leland and Gray Seminary, \$10,000.
- Foot, Mrs. W. A., Jackson, Mich., will to hospital, \$80,000.
- Ford, Amory L., Detroit, Mich., gift to Princeton University, \$100,000.
- Ford, Henry, Detroit, Mich., gift to employees, \$630,000.
- Fordham University, will by Mary V. McCusker, \$8000.
- Forker, Amelia I., Philadelphia, Pa., will to charity, \$17,000.
- Fort Norwich University, gift by Rough Riders, \$100,000.
- Foulds, Alice C., White Plains, N. Y., will to charity, \$50,000.
- Fox, Elijah, Haverhill, Mass., will to church, \$37,000; will to schools, \$20,000.
- Frankenthal, Jacob, New York, will to charity, \$5000.
- Freedman, Andrew, New York, will to charity, \$40,000.
- Freeman, James A., Pasadena, Cal., will to Occidental College, \$5000.
- French, Elizabeth M., Brookline, Mass., will to charity, \$85,000.
- Frick, Henry C., Pittsburgh, Pa., gift to schools, \$250,000; to Princeton University, \$100,000.
- Gallawder, Jessie, New York, will to church, \$1,000,000.
- Gamble, Mr. and Mrs. D. B., Cincinnati, O., gift to Smith College, \$60,000; gift to Occidental College, \$50,000.
- Gamble, Mary McGull, Wellesley, Mass., will to charity, \$16,000.
- Garrett Biblical Institute, Chicago, Ill., gift by unnamed donor, \$5000.
- Gates, Mrs. J. W., Port Arthur, Texas, gift to schools, \$7000; gift of library to Port Arthur, Texas, \$50,000.
- Gaunt, James, New York, will to charity, \$18,000.
- Gehan, Katherine, Warren, Ohio, will to charity, \$5000.
- Gellatly, Mrs. E. R., New York, will to charity, \$40,701.
- General Education Board, gift to University of Chicago for medical school, \$1,000,000; to Knox College, \$100,000; to Rockford, Ill., College, \$75,000; to Washington University, \$250,000; to other educational institutions, \$2,424,980.
- George Junior Republic, gift by Henry C. Hubbell, \$14,000.
- Gere, Harriet, Albion, N. Y., will to church, \$6000.
- German-American Bazar, Philadelphia, Pa., to German Red Cross, \$200,000.
- German Charities, Los Angeles, Cal., gift by various donors, \$18,000.
- German Red Cross, gift by German-American Bazar, \$200,000.
- Gerry, Elbridge T., New York, gift to church, \$5000.
- Gibson, Isabella, Buffalo, N. Y., will to charity, \$9500.
- Gillender, Jessie, New York, will to Johns Hopkins University, \$150,000; to Metropolitan Art Museum, \$50,000; to charity, \$550,000.
- Givenand, Barbara, Durham, N. Y., will to church, \$250,000.
- Glasgow, Ky., gift to church by various donors, \$12,500.
- Glass, Henry, New York, will to Jewish charities, \$10,000.
- Goddard, R. H. I., Providence, R. I., will to Brown University, \$10,000; to charity, \$22,000.
- Goddard Seminary, gift by Ira C. Cleaf, \$10,000.
- Golden Gate Park Museum, gift by T. S. C. Lowe, \$250,000; by various donors, \$1,045,000; will by Alice Skroo, \$10,000.

- Gordon, G. C., Philadelphia, Pa., will to charity, \$5000.
- Goshen College, gift by John Ropp, \$18,000.
- Graves, Mrs. John B., Georgetown, Ky., gift to hospital, \$25,000.
- Gray, Mr. and Mrs. H. C., Columbus, Ohio, gift to Orphans' Home, \$25,000.
- Green, David P., Chicago, Ill., will to charity, \$15,000.
- Grinnell College, gift by Dr. L. B. Dibble, \$100,000.
- Griswold, Stephen M., New York, will to charity, \$13,000.
- Guggenheim, Benjamin, New York, will to charities, \$100,000.
- Guggenheim, Simon, New York, gift to Hampton Institute, \$12,000.
- Guggenheim Brothers, New York, gift to Mt. Sinai Hospital, \$165,000.
- Hale, Henry C., St. Paul, Minn., will to city, \$200,000.
- Hamilton, J., Los Angeles, Cal., will to church, \$100,000.
- Hamline University, gift by Rockefeller Foundation, \$100,000; by various donors, \$500,000.
- Hampton Normal and Agricultural Institute, gift by Mrs. D. W. James, \$100,000; gift by Simon Guggenheim, \$12,000; will by Martha Andrews, \$50,000.
- Hamsher, Mrs. L. E., Bradford, Pa., gift to charity, \$35,000.
- Hancock, W. S., Trenton, N. J., will to charity, \$678,000.
- Hardenberg, W. P., New York, gift to Rutgers College, \$10,000.
- Harkness, Charles W., New York, gift to Yale University, \$500,000; will to Yale University, \$500,000; to Presbyterian Hospital, \$300,000; to charities, \$500,000; to educational and scientific work, \$250,000.
- Harkness, Mary, New York, will to Cleveland Art Museum, \$100,000; to charities, \$500,000; to church, \$200,000; to Yale University, \$300,000.
- Harris, Albert W., Chicago, Ill., will to charity, \$700,000.
- Harris, Benjamin, Rennselaer, Ind., will to charity, \$25,000.
- Harvard Observatory, gift by various donors, \$12,000.
- Harvard University, gift by Samuel Sachs, \$40,000; by various donors, \$1,427,718; will by Horace Davis, \$70,000; by Eunice W. Hudson, \$150,000; by F. W. Kimball, \$100,000; by Gordon McKay, \$22,000,000; by William Murphy, \$40,000.
- Haverford College, will by T. Wistar Brown, \$409,321; gift by various donors, \$567,800.
- Havastick, Horace, Philadelphia, Pa., will to church, \$35,000.
- Hay, James, Philadelphia, Pa., will to charity, \$40,000; to church, \$40,000.
- Hayden, daughters of W. E., gift to library at Panama, \$10,000.
- Hayes, Kaufman, Cleveland, Ohio, will to charity, \$90,000.
- Hearst, Phoebe A., San Francisco, Cal., gift to school of opera, \$10,000.
- Heinz, H. J., gift to Kansas City University, \$25,000.
- Heim, Mrs. J. H., Louisville, Ky., will to Rescue Home, \$10,000.
- Henry Street Settlement, New York, gift by various donors, \$600,000.
- Henschel, Martha, Kingston, N. Y., gift to charity, \$75,000.
- Herrman, Sophia H., Philadelphia, Pa., will to charity, \$16,000.
- Hess, Anna, New York, will to charity, \$13,000.
- Hess, Ghan, Auburn, N. Y., will to Brown University, \$100,000.
- Highland Park, Ill., gift to hospital by various donors, \$100,000.
- Hill, Drs. A. L. and R. S., gift of hospital to Montgomery, Ala., \$26,500.
- Hillman, Mrs. T. T., Birmingham, Ala., gift to Athens College, \$5000.
- Hirsch, Samuel, New York, will to Jewish charities, \$300,000.
- Hirsch heirs, Atlanta, Ga., will to hospital, \$10,000.
- Hodge, J. M., Dover, N. H., will to charity, \$8000.
- Holme, Lizzie H., New York, will to charity, \$30,000.
- Holmes, Esther, Munson, Mass., gift to Pomona College, \$20,000.
- Holyoke College, will by Louise F. Crane, \$5000.
- Home for Aged, will by J. L. Peacock, \$850,000; gift by Hettie K. Vorhis, \$60,000.
- Home for Aged Women, Nashua, N. H., will by Clara M. Wheeler, \$5000.
- Home for Deaf Mutes, Boston, Mass., gift by various donors, \$15,000.
- Homeopathic Hospital, Chester Pa., gift by Mrs. J. L. Crozer, \$28,000.
- Homeopathic Hospital, Pittsburgh, Pa., gift by various donors, \$500,000.
- Horton, Belle N., Middletown, Ky., will to hospital, \$18,000.
- Hospital for Incurables, Philadelphia, Pa., will by T. M. Knight, \$300,000.
- Hospitals, New York, gifts by various donors, \$7889.
- Houghton, Albert C., Troy, N. Y., will to charity, \$50,000.
- Howe, Abigail W., Cambridge, Mass., will to charity, \$26,500.
- Howell, James E., Newark, N. J., will to public library, \$250,000.
- Howison, Mr. and Mrs. George H., Berkeley, Cal., gift to University of California, \$70,000.
- Hubbell, Henry C., Bridgeport, Conn., gift to George Junior Republic, \$14,000.
- Hudson, Eunice W., Boston, Mass., will to charity, \$50,000; to Harvard University, \$150,000.
- Humane Society, gift by Joseph G. Butler, \$10,000.
- Hunsberger, Sarah C., Allentown, Pa., gift to hospital, \$50,000.
- Hunter, Mrs. T. F., Philadelphia, Pa., gift to Children's Hospital, \$5000.
- Huntington, A. M., New York, gift to Museum of the American Indian, \$140,000.
- Illinois Wesleyan College, will by S. W. Kirkpatrick, \$50,000.
- Indianapolis, Ind., gift to Girls' Home by various donors, \$100,000.
- Institute for Christian Workers, Philadelphia, Pa., gift by various donors, \$50,000.
- Iowa Wesleyan College, gift by various donors, Mount Pleasant, Iowa, \$100,000.
- Italian Bazaar, New York, gifts to, \$48,325.
- Jackson, Mary Van Nest, New York, will to charity, \$150,000.
- James, Mrs. D. W., New York, gift to Berea College, \$40,000; will to charity, \$2,250,000; to church, \$200,000; to Hampton Agricultural Institute, \$100,000.
- James, Ellen D., New York, gift to charity, \$450,000; will to church, \$750,000.
- Japanese Exposition Commission's gift of exhibits to University of California, \$70,000.
- Jarvie, James N., New York, gift to Columbia University, \$100,000.
- Jenkins, Eliza, Baltimore, Md., will to church, \$1,000,000.
- Jenkins, W. S., Clinton, Mass., will to charity, \$31,000.
- Jewish charities, gift by Samuel Hirsch, \$300,000; by various donors, \$4,250,000; will by Henry Glass, \$10,000; by various donors, New York, \$100,000.
- Jewish Home for Old People, New York, gift by various donors, \$75,000.
- Jewish relief donations, \$684,000.
- Jewish relief fund, gift by various donors, Harrisburg, Pa., \$6000; by various donors, \$2,500,000.
- Jewish Teachers' Fund, gift by Louis Marshall, \$150,000.
- Jokey Club, Baltimore, Md., gift to charity, \$10,000.
- Johns Hopkins Hospital, gift by Blanchard Randall and Howard Kelly, \$100,000; by Kenneth Dows, \$95,200.
- Johns Hopkins University, gift by Rockefeller University, \$200,000; by unnamed donor, \$85,000; will by Jessie Gillender, \$150,000.
- Johnson, E. H., Camden, N. J., gift of library to city, \$100,000.
- Johnson, Henry J., Millersburg, Pa., will for library, \$50,000.
- Jones, Kate, New York, will to church, \$5000.
- Jones, William H., Pasadena, Cal., will to Chicago Boys' Club, \$100,000.
- Jordan, Eben D., Boston, Mass., will to New England Conservatory of Music, \$100,000.
- Joslyn, George A., Omaha, Neb., will to charity, \$20,000.
- Judson Memorial fund, gift by New York City Mission Baptist Society, \$210,000.
- Juilliard, Helen C., New York, will to American Museum of Natural History, \$50,000; to church, \$100,000; to Colorado College, \$50,000; to other institutions, \$500,000.
- Kalamazoo College, will by Cordelia Reed, \$12,000.
- Kalb, Charles M., Philadelphia, Pa., will to church, \$1,000,000.
- Kansas City Art Institute, gift by Mrs. W. B. Thayer, \$75,000.
- Kansas City University, gift by H. J. Heinz, \$25,000.
- Kansas Wesleyan University, gift by W. L. Nesmith, \$15,000.
- Katsuko, M., New York, gift to Methodist College, Tokyo, \$75,000.
- Kaufman, Henry, New York, gift of hospital for deformities, \$1,000,000.
- Kellogg, Ellen P., New York, will to charity, \$45,000; will to Yale University, \$5000.

- Kelly, John, Sacramento, Cal., will to charity, \$256,000.
- Kelly, Robert M., New York, gift to Yale University, \$125,000.
- Kenenck, Mr. and Mrs. William, Kansas City, Mo., gift to hospital, \$5000.
- Kenard, S. M., St. Louis, Mo., will to charity, \$27,000.
- Kenosha, Wis., gift by various donors for children's playgrounds, \$10,000.
- Kenrick, George W., Philadelphia, Pa., will to Bryn Mawr College, \$5000.
- Kenyon College, will by William Thompson, \$30,000.
- Kimball, Edward R., Ashland, Mass., will to charity, \$10,000.
- Kimball, F. W., Chelsea, Mass., will to Harvard University, \$100,000.
- Kirkpatrick, S. W., Parma, Idaho, will to Illinois Wesleyan College, \$50,000.
- Kistbach, John, Farmer City, Ill., gift to mission, \$75,000.
- Kleinsmid, R. B. von, gift to University of Arizona, \$60,000.
- Knight, T. M., Philadelphia, Pa., will to charities, \$150,000; will to Hospital for Incurables, \$300,000.
- Knights of Columbus, gift to University of Michigan, \$25,000.
- Knox College, gift by Rockefeller General Education Board, \$100,000; by Mrs. Russell Sage, \$75,000; various donors, \$825,000.
- Knox, Edward M., New York, will to charity, \$5000; to church, \$25,000.
- Kofron, Dr. J. B., Cleveland, Ohio, gift for musical conservatory, \$25,000.
- Kohn, Elizabeth, San Francisco, Cal., will to charity, \$7500.
- Lafayette College, gift by Mrs. J. T. Manson, \$50,000; will by William Runkle, \$100,000; will by Albert M. Seip, \$250,000.
- Lang, Mrs. Henry, gift to Montclair, N. J., High School, \$10,000.
- Lathrop, Bryan, Chicago, Ill., will to Chicago Symphony Association, \$100,000; to Chicago Symphony Orchestra, \$60,000; to charity, \$50,000.
- Lawrence College, gift by Mrs. Russell Sage, \$100,000; gift by Edwin St. Clair, \$35,100.
- Lawrence, William W., New York, will to Princeton University, \$1,000,000.
- Lea, Elizabeth W., Indianapolis, Ind., will to public library, \$5000.
- Learned, B. H., New London, Conn., will to charity, \$84,000.
- Leask, Mary, New York, will to charity, \$67,000.
- Lehigh College, gift by Mrs. C. M. Schwab, \$50,000.
- Lehmaier, Rachel, New York, will to charity, \$149,000.
- Leland and Gray Seminary, will by Harriet Fletcher, \$10,000.
- Leland Stanford Junior University, will by Horace Davis, \$10,000.
- Leonard, Sarah L., Cleveland, Ohio, will to church and charities, \$119,000.
- Lewisohn, Adolph, New York, gift to charity, \$30,000; for philanthropic research, \$15,000.
- Lick Observatory, gift by Josephine A. Phelps, \$25,000.
- Lindeman, Elvira, Chicago, Ill., gift to charity, \$9100.
- Lindenwood College, gift by James G. Butler, \$100,000.
- Lindenwood Female College, will by James G. Butler, \$50,000.
- Lippitt, Sarah L., Hartford, Conn., will to charity, \$5500.
- Livingston, Samuel C., Greenville, Pa., will to Thiel College, \$50,000.
- Logansport, Ind., gift by various donors to hospital, \$16,103.
- Longley, James, Boston, Mass., will to Chicago Presbyterian Hospital, \$150,000.
- Los Angeles, Cal., gifts to Board of Education, \$45,000; to charity by various donors, \$32,000.
- Louisville, Ala., gift by various donors to school, \$10,000.
- Lowe, T. S. C., San Francisco, Cal., gift to Golden Gate Park Museum, \$250,000.
- Lowndes, Frank D., New York, will to charity, \$5000.
- Ludlin, Nicoll, New York, will to church, \$10,000; to charity, \$15,000.
- Lying-in-Hospital, gift by Mrs. J. H. Moore, Chicago, Ill., \$200,000.
- McCusker, Mary V., New York, will to Fordham University, \$8000.
- McElvey, Miss and Mrs. J. H. Wright, Montclair, N. J., gift to Western College for Women, \$50,000.
- McIntosh, William H., Auburn, Ind., gift to schools, \$10,000.
- McKay, Gordon, Boston, Mass., will to Harvard University, \$22,000,000.
- McKendree College, gift by Southern Illinois Methodist Conference, \$25,000.
- McKeown, James, Philadelphia, Pa., will to charity, \$9650.
- McLaughlin, Mary J., Chicago, Ill., will to charity, \$10,000; will to hospital, \$10,000.
- McNeelev, Frederick S., Trenton, N. J., will to charity, \$100,000.
- Macalaster College, gift by various donors, \$250,000.
- Mack, Eleanor S., Boston, Mass., will to charity, \$12,500.
- Madison Zoo, gift by Charles Vilas, \$30,000.
- Mallinckrodt, Edward, St. Louis, Mo., gift to children's hospital, \$100,000.
- Manson, Mrs. J. T., New Haven, Conn., gift to Lafayette College, \$50,000.
- Marescaux, Alice W., New York, will to church, \$5000.
- Marquette University, gift by various donors, \$603,471.
- Maraden, William, Fennimore, Wis., will to schools, \$16,000; for park, \$100,000.
- Marshall, Louis, New York, gift to Jewish Teachers' Fund, \$150,000.
- Martin, Howard T., New York, will to charity, \$10,000.
- Martin, Mary E., New York, will to charity, \$5000.
- Massachusetts College of Pharmacy, gift by unnamed donor, \$330,000.
- Massachusetts Institute of Technology, gift by various donors, \$2,537,660.
- Massadler, John T., Donaldsonville, La., will to schools, \$23,000.
- Massey, Hart A., gift to American University, \$50,000.
- Masters' School, gift to Dobbs Ferry, N. Y., \$500,000.
- Mav, Solomon, Cincinnati, Ohio, will to charity, \$30,000.
- Meadville Theological Seminary, \$55,000.
- Mellon, Mary, Philadelphia, Pa., will to charity, \$12,000.
- Memorial Hospital, Nashville, Tenn., gift by various donors, \$270,000.
- Memorial Hospital, Ogontz, Pa., gift by George W. Elkins, \$250,000.
- Memphis, Tenn., gift by various donors to church, \$10,000.
- Mercer Hospital, Trenton, N. J., will by W. E. Whittaker, \$123,801.
- Merck Co., Rahway, N. J., gift to Y. M. C. A., \$25,000.
- Mercy Hospital, Chicago, Ill., gift by James A. Paten, \$10,000.
- Merrill heirs, Saginaw, Mich., gift to church, \$25,000.
- Meserole, Eveline A., New York, will to charity, \$30,000; to church, \$16,000.
- Methodist book committee, New York, gift to aged pastors, \$275,000.
- Methodist Church, contributions to foreign missions, \$1,933,256.
- Methodist churches of Cleveland, Ohio, gift to ministers' fund, \$100,000.
- Methodist College, Tokyo, gift by M. Katsuko, \$75,000.
- Methodist Episcopal board of foreign missions, gift by various donors, \$25,000.
- Methodist Episcopal Church, South, gift to assembly ground, \$103,000.
- Methodist ministers' pension fund, \$1,000,000.
- Methodist pastors' pension fund, gift by unnamed donor, \$10,000; by other donors, \$7000.
- Methodist pension fund, New York, gift by unnamed donor, \$40,122.
- Methodist preachers' pension fund, gift by unnamed donor, \$50,000.
- Methodist Women's Home Mission Society, donation to missions, Columbus, Ohio, \$700,000.
- Metropolitan Museum of Art, will by Harris B. Dick, \$1,000,000; will by Jessie Gillender, \$50,000; art gifts by J. P. Morgan, \$1,000,000; gift by George F. Baker, \$105,000; gift by Emil C. Bondy, \$35,095; will by Hugo Reisinger, \$50,000.
- Metropolitan Life Insurance Company, gift to Association for Study of Tuberculosis, \$100,000.
- Metz, Herman A., New York, gift to charity, \$20,000.
- Michigan, University of, gift by Knights of Columbus, \$25,000; by W. J. Olcott, \$5000; by various donors, \$25,000; will by Ella M. Walker, \$22,000.
- Michigan Agricultural College, gift by R. W. Olds, \$100,000.
- Miller, Henry, San Francisco, Cal., will to charity, \$900,000.
- Miller, Rachel McMasters, Turtle Creek, Pa., gift of park to town, \$22,000.
- Milwaukee, Wis., gift to charity by various donors, \$15,000; to church by various donors, \$50,000.
- Milwaukee-Downer College, gift by Rockefeller Foundation, \$100,000.

- Mineola, L. I., gift to charity by various donors, \$33,000.
- Mining and Mechanic Institute, Freeland, Pa., will by Eckley B. Cox, \$25,000.
- Minneapolis, Minn., gift to missions by various donors, \$8000.
- Minneapolis Art Museum, gift by unnamed donor, \$225,000.
- Minnesota, University of, gift by Y. M. C. A., \$60,000; gift by various donors, \$1,500,000.
- Mission House College, Franklin, Wis., gift by various donors, \$100,000.
- Mississippi Valley flood sufferers, donation by Red Cross, \$20,000.
- Mitchell, H. L., Houston, Texas, will to church, \$7500.
- Moffatt, Henry, Streator, Ill., gift to church, \$40,000.
- Monroe, Eva, Joliet, Ill., will to church, \$5000.
- Moore, Elisabeth S., Greenberg, Ind., gift to church, \$15,000.
- Moore, Mrs. J. H., Chicago, Ill., gift to Lying-in-Hospital, \$200,000.
- Moore, Mrs. Sidney, Delaware, Ohio, will to charity, \$30,000.
- Morgan, J. P., New York, gift to Canadian relief fund, \$20,000; art gifts to Metropolitan Museum of Art, \$1,000,000.
- Morgan, Mr. and Mrs. William, Buffalo, N. Y., gift to church, \$7000.
- Morrison, Anna E., New York, will to charity, \$150,000.
- Morrison, Charles E., Chicago, Ill., will to orphan asylum, \$700,000.
- Morse, Mary, Ballows Falls, Vt., will to church, \$6000.
- Morton, Jay, Chicago, Ill., gift to Episcopal Church school, \$25,000.
- Mossman, William, Fort Wayne, Ind., gift to Y. M. C. A., \$50,000.
- Mt. Sinai Hospital, gift by Charles A. Wimpfheimer, \$380,000; by various donors, \$500,000.
- Moving Picture industries, gift to Actors' Fund, \$800,000.
- Moyer, Josephine E., Philadelphia, will to charity, \$43,000.
- Muir, Mary E., Lexington, Ky., will to State university, \$55,000.
- Muncie Normal Institute, gift by Mrs. M. W. Springer-Oliver, \$15,000.
- Murnay, Patrick, Hartford, Conn., will to charity, \$35,000.
- Murphy, Mary, Newton, Mass., will to charity, \$13,500.
- Murphy, William, Boston, Mass., will to Harvard University, \$40,000.
- Murphy, William M., Philadelphia, Pa., will to church, \$6000.
- Museum of the American Indian, gift by A. M. Huntington, \$140,000.
- Muskingum College, gift by various donors, \$250,000; will by John Reeder, \$35,000.
- National Watch Co., Elgin, Ill., gift to charity, \$100,000.
- Nesmith, W. L., Salina, Kan., gift to Kansas Wesleyan University, \$15,000.
- Neumeier, Elizabeth F., Louisville, Ky., will to charity, \$6500.
- Nevil, George W., Philadelphia, Pa., gift to charity, \$5000.
- Newcomb College, gift by unnamed donor of Tulane University, \$1,000,000.
- New England Conservatory of Music, will by Eben D. Jordan, \$100,000.
- New Methodist University, gift by various donors of Georgia, \$770,000.
- New Orleans, La., gift to charity by five New Orleans banks, \$500,000; gift to city hospital by unnamed donor, \$8600.
- Newton, Elizabeth M., Fredonia, N. Y., will for hospital, \$100,000.
- Newton, Mary B., Baltimore, Md., will to disabled ministers' fund, \$75,000; will to Virginia Home for Incurables, \$25,000.
- New York, gift to charity by various donors, \$198,753; gift to church by unnamed donor, \$60,000; gift to hospital by various donors, \$75,000; gift to infantile paralysis fund by various donors, \$9463.
- New York City Mission Baptist Society, gift to Judson Memorial Fund, \$210,000.
- Nicholls, Mark N., Cleveland, Ohio, will to charity, \$50,000.
- Nickerson, Lyra B., Providence, R. I., will to Providence public library, \$1,500,000; will to Rhode Island School of Design, \$1,500,000.
- Niebrugge, Henry, Collinsville, Mo., will to church, \$15,000.
- Noe, Nellie, New York, will to charity, \$25,285.
- Non-Sectarian School of Religion, gift by Wisconsin Methodists, \$150,000.
- Noonan, Margaret E., Boston, Mass., will to charity, \$6900.
- Norristown, Pa., gift to hospital by various donors, \$5000.
- Northwestern University, gift by James G. Patten, \$134,000; by Mrs. G. F. Swift, \$5000; by M. H. Wilson, \$10,000.
- Norwegian Hospital, Chicago, Ill., gift by unnamed donors, \$150,000.
- Norwich University, gift by G. M. Dodge, \$50,000.
- Noyes, La Verne W., Chicago, Ill., gift to University of Chicago, \$190,000.
- Oberlin College, will by Dudley F. Allen, \$100,000; will by F. N. Feriney, \$112,500; will by Frances E. Shepherd, \$20,000.
- Occidental College, gift by Mr. and Mrs. D. B. Gamble, \$50,000; by E. W. Fridham, \$25,000; will by James A. Freeman, \$5000.
- O'Connor, Thomas H., New York, will to charity, \$25,000.
- Ogden, Joseph W., Morristown, N. J., will to charity, \$7000.
- O'Hair, Bascom, Greencastle, Ind., will to De Pauw University, \$25,000; will to church, \$15,000.
- Olcott, W. J., Duluth, Minn., gift to University of Michigan, \$5000.
- Olds, R. W., Lansing, Mich., gift to Michigan Agricultural College, \$100,000.
- Oliver, Mrs. H. W., Washington, Pa., gift to church, \$50,000.
- Oneida Mountain Institute, will by J. L. Torrey, \$10,000.
- Orange, N. J., gift to hospital by various donors, \$61,000.
- Orphans' Home, Columbus, Ohio, gift by Mr. and Mrs. H. C. Gray, \$25,000.
- Orphans' Home, Fairmont, Minn., gift by A. L. Ward, \$45,000.
- Orphans' Home, Roxborough, Pa., will by Elizabeth L. Clarke, \$68,025.
- Otis, Harrison Grey, Los Angeles, Cal., gift of park to city, \$150,000.
- Paderewski, concert for Polish benefit, Philadelphia, Pa., \$10,000.
- Palmer, Frances O., will to charity, Hartford, Conn., \$83,000.
- Palmer, Lizzie M., Detroit, Mich., will for motherhood home, \$3,000,000.
- Park, David E., Pittsburgh, Pa., gift to church, \$25,000.
- Passavant Hospital, Pittsburgh, Pa., gift by various donors, \$100,000.
- Patten, James A., Evanston, Ill., gift to Evanston Hospital, \$125,000; gift to Mercy Hospital, Chicago, Ill., \$10,000; gift to Northwestern University, \$134,000.
- Peabody, Philip G., Boston, Mass., gift to prevent lynching, \$11,000.
- Peacock, J. L., Lancaster, Pa., will to Home for Aged, \$850,000.
- Pekin, Ill., gift by various donors for a hospital, \$80,000.
- Penn College, gift by various donors, \$400,000.
- Pennsylvania, University of, gift by B. C. Allen, \$10,000; by Eckley B. Cox, \$600,000; will by J. William White, \$400,000.
- Pennsylvania State Sabbath School Association, gift by various donors, \$40,000.
- Pentecostal Church University, Pasadena, Cal., gift by various donors, \$500,000.
- Peoria, Ill., gift to charity by unnamed donor, \$15,000.
- Peters, William A., New Brunswick, N. J., will to church, \$200,000.
- Pfeiffer, Mrs. E. H., New York, will to charity, \$25,000.
- Phelps, Josephine A., San Francisco, Cal., will to charity, \$100,000; to Lick Observatory, \$25,000.
- Philadelphia, Pa., gift to ministerial relief fund by unnamed donor, \$100,000; to Zionist Movement by various donors, \$175,000.
- Philadelphia Orchestra, gift by unnamed donors, \$250,000.
- Phillips Exeter Academy, gift by Andrew Carnegie, \$45,000.
- Pierce, Luther H., Bangor, Me., will to hospital, \$100,000; will to library, \$100,000.
- Pinney, W. E., Valparaiso, Ind., gift to Valparaiso University, \$50,000.
- Pitcairn, John, Philadelphia, Pa., will to charity, \$10,000; to church, \$103,000.
- Pittsburgh, Pa., gift to church by various donors, \$15,000; to orphan asylum by unnamed donor, \$15,000.
- Plant, Morton F., New London, Conn., gift to church, \$10,000.
- Polish benefit, Philadelphia, Pa., concert by Paderewski, \$10,000.
- Pomona College, gift by Esther Holmes, \$20,000.
- Port Arthur, Texas, gift to schools by various donors, \$26,000.

- Porter, Mrs. C. A., Boston, Mass., gift to charity \$10,000.
- Presbyterian College of South Carolina, gift by George H. Cornelson, \$5,000; gift by unnamed donor, \$10,000.
- Presbyterian Hospital, New York, gift by Charles W. Harkness, \$300,000.
- Presbyterian relief fund, New York, gift by unnamed donor, \$100,000.
- Preston, J. C., Orleans, Neb., gift for library, \$20,000.
- Fridham, R. W., Los Angeles, Cal., gift to Occidental College, \$25,000.
- Princeton University, gift by Marie A. Fiske, \$115,000; by Emory L. Ford, \$100,000; by Henry C. Frick, \$100,000; by William W. Lawrence, \$1,000,000; by various donors, \$94,000.
- Protestant Episcopal Foundation, provisional bequest by Margaret S. R. White, \$200,000.
- Protestant Episcopal Pension Fund, gift by various donors, \$2,500,000.
- Prouty, H. H., Mazama, Ore., will to Salvation Army, \$15,000.
- Pullman, Mrs. Geo. W., Chicago, Ill., gift to St. Luke's Hospital, \$100,000.
- Putnam, H. W., New York, gift to Bennington Street Hospital, \$90,000.
- Randall, Blanchard and Howard Kelly, gift to Johns Hopkins Hospital, \$100,000.
- Ranger, H. W., New York, will to charity, \$200,000.
- Rath, William, will of park to Ludington, Mich., \$25,000.
- Rawson, Fred H., Chicago, Ill., gifts to University of Chicago Medical School, \$300,000.
- Raymond, Mrs. J. M., Chicago, Ill., gift to charity, \$20,000.
- Read, William A., New York, will to charity, \$40,000.
- Rector, Edward, Chicago, Ill., gift to De Pauw University, \$100,000.
- Red Cross donations for civilian and military relief, \$962,561.
- Reed, Cordelia, Niles, Mich., will to church, \$12,000; will to Kalamazoo College, \$12,000.
- Reeder, John, Hamilton, Ohio, will to Muskingum College, \$25,000.
- Reid, Carl, Sheboygan, Wis., will to charity, \$5,000.
- Reinhard School, will by George Windship, \$5,000.
- Reisinger, Hugo, New York, will to Metropolitan Museum, \$50,000.
- Remick, Eliza K., Littleton, N. H., will to hospital, \$10,000.
- Rescue Home, Louisville, Ky., will by Mrs. J. H. Helm, \$10,000.
- Rhode Island School of Design, gift by Lyra B. Nickerson, \$1,500,000.
- Rhodes, Robert R., Cleveland, Ohio, will to charity, \$1,675,000.
- Rice, Emily A., Providence, R. I., will to church, \$13,200.
- Rice, Mrs. I. L., New York, gift to hospital, \$250,000.
- Richmond, Va., gift to church by various donors, \$56,779.
- Ripon College, gift by various donors, \$375,000.
- Robinson, Aaron J., Exeter, N. H., will to Tilton Seminary, \$35,000.
- Robinson, R. R., Malden, Mass., gift to Boston Universal School of Medicine, \$50,000.
- Robinson, W. F., Boston, Mass., gift to Dartmouth College, \$75,000.
- Rochester, University of, jointly with Mechanics Institute, will by Lewis P. Ross, \$1,000,000; will by Marie H. Snow, \$10,000.
- Rockefeller, John D., gift to Y. W. C. A., \$500,000.
- Rockefeller Foundation, gift to Armenian relief fund, \$50,000; to Belgian relief, \$200,000; for care of insane, \$22,800; to charitable work, \$1,200,000; to charities, \$32,000; to Chattanooga University, \$31,000; for fighting infantile paralysis, \$50,000; to Hamline University, \$100,000; to Johns Hopkins University, \$200,000; to Milwaukee-Downer College, \$100,000; to Rockefeller Institute for Medical Research, \$160,000; to University of Chicago for medical school, \$1,000,000; to Y. M. C. A., \$115,000; miscellaneous gifts, \$575,775.
- Rockefeller Institute for Medical Research, gift by Rockefeller Foundation, \$160,000.
- Rockford, Ill., College, gift by Rockefeller General Education Board, \$75,000.
- Rock River, conference fund for ministerial relief by various donors, \$200,000.
- Rockwell, Adaline, Syracuse, N. Y., will to church, \$5,000.
- Ropp, John, Bloomington, Ill., gift to Goshen College, \$16,000.
- Rosenwald, Julius, Chicago, Ill., gift to Columbus, Ohio, Y. M. C. A., \$25,000; to Sachs Memorial Hospital, \$5,000.
- Rosenwald, Mr. and Mrs. Julius, Chicago, Ill., gift to University of Chicago for medical school, \$500,000.
- Ross, Lewis P., Rochester, N. Y., will to University of Rochester and Mechanics Institute, \$1,000,000.
- Rough Riders, gift to Fort Norwich University, \$100,000.
- Roulston, Robert, Chicago, Ill., gift to St. Luke's Hospital, \$25,000.
- Ruddoch, Charles H., New York, gift to University of Chicago Medical School, \$200,000.
- Runkle, William, Orange, N. J., will to charity, \$80,000; to church, \$145,000; to Lafayette College, \$100,000; to library, \$25,000.
- Russell, C. M., Massillon, Ohio, gift to hospital, \$50,000.
- Russian Bazaar, New York, \$50,000.
- Rutgers College, gift by W. P. Hardenberg, \$10,000; by various donors, \$1,050,000; by Mrs. W. J. Wright, \$10,000.
- Ryerson, Martin A., Chicago, Ill., gift to University of Chicago Medical School, \$250,000.
- Sachs, Samuel, New York, gift to Harvard University, \$40,000.
- Sachs Memorial Hospital, gift by Julius Rosenwald, \$5,000; by Mrs. Keith Spaulding, \$5,000.
- Safford, Mrs. D. B., Hot Springs, N. C., gift to tuberculosis hospital, \$100,000.
- Sage, Mrs. Russell, New York, gift to charity, \$20,000; to church, \$5,000; to found Domestic Art School, \$250,000; to Knox College, \$75,000; to Lawrence College, \$100,000; of organ to church, \$10,000; to Seamen's Home, \$25,000; to Syracuse University, \$15,000.
- St. Charles Theological Seminary, Overbrook, Pa., gift by various donors, \$30,000.
- St. Christina School, Saratoga, N. Y., gift by various donors, \$90,805.
- St. Clair, Edwin, Appleton, Wis., gift to Lawrence University, \$35,100.
- St. Francis, Kan., gift of church by various donors, \$14,000.
- St. Francis College, gift by Charles M. Schwab, \$2,000,000.
- St. Louis, Mo., gift to charity by various donors, \$32,676; to charity by unnamed donors, \$12,000; to hospital by various donors, \$37,276; to Y. M. C. A. by unnamed donor, \$25,000.
- St. Luke's Hospital, Chicago, Ill., gift by J. O. Armour, \$100,000; by Mrs. George M. Fullman, \$100,000; by Robert Roulston, \$25,000; by trustees of hospital, \$120,000; by Mrs. H. H. Walker, \$25,000; by Hobart Williams, \$200,000.
- St. Paul's School, Concord, N. H., gift by unnamed donor, \$175,000.
- St. Stephen's College, gift by various donors, \$20,000.
- St. Vincent's Hospital, Montclair, N. J., gift by unnamed donor, \$20,000.
- Salvation Army, gift by John Wanamaker, \$10,000; by various donors, \$300,000; by various donors, Ogdensburg, N. Y., \$10,000; will by Henry Dexter, \$258,936; will by H. H. Prouty, \$15,000.
- Salvation Army Institute, Pittsburgh, Pa., gift by various donors, \$202,000.
- Salvation Army Training Schools, gift by various donors, \$250,000.
- San Francisco, Cal., gift by unnamed donor for preservation of Palace of Art, \$100,000; gift to working girls' home by various donors, \$340,000.
- Sayre, Rufus, Riverhead, L. I., will to schools, \$30,000.
- Schaefer, Anne M., Philadelphia, Pa., will to church, \$5800.
- Schlesinger, Mr. and Mrs. Ferdinand, Milwaukee, Wis., gift to Children's Hospital, \$150,000.
- School of Domestic Arts and Sciences, gift by Columbian World's Fair Fund, \$100,000.
- Schroeder, Geo. H. S., White Plains, N. Y., will to Women's Convalescent Home, \$3,000,000.
- Schwab, Mrs. C. M., Bethlehem, Pa., gift to Lehigh College, \$50,000.
- Schwab, Charles W., Baltimore, Md., gift to St. Francis College, \$2,000,000.
- Scott, Theresa, Atlantic City, N. J., will to charity, \$6500.
- Seabury, Clara E., New York, will to charity, \$5900.
- Seaman's Home, gift by Mrs. Russell Sage, \$25,000.
- Seattle, Wash., gift to charity by various donors, \$25,000.
- Selp, Albert M., Washington, Pa., will to Lafayette College, \$250,000.
- Shafroth, William, Fayette, Mo., gift to charity, \$100,000.
- Shannon, R. C., Brockport, N. Y., gift to Colby College, \$125,000.
- Shepherd, Frances E., will to Oberlin College, \$30,000.
- Sherman, Julia, Elgin, Ill., will to charity, \$5,000.
- Shoemaker, Mary, Springfield, Mass., will to charity, \$90,000.
- Shriners, Reno, Nev., gift to Augusta, Ga., fire sufferers, \$50,000.
- Shunk, Julia W., Cleveland, Ohio, will to charity, \$38,000.



- Silvernale, Isaac, Philadelphia, Pa., will to charities, \$200,000.
- Simmons, heirs, gift of public park to Kenosha, Wis., \$400,000.
- Sinai Hospital, gift by Guggenheim brothers, \$165,000.
- Sioux City, Iowa, gift to charity by various donors, \$6000.
- Sioux Falls, Iowa, gift for college by various donors, \$125,000.
- Sisters of Mercy, San Francisco, Cal., gift by various donors, \$5000.
- Sisters of Sacred Heart Orphanage, gift by citizens of Seattle, \$20,000.
- Skroce, Alice, San Francisco, Cal., will to Golden Gate Park Museum, \$10,000.
- Slaughter, G. C., Dallas, Texas, gift to church, \$10,000.
- Smith, Charles K., Philadelphia, Pa., will to missions, \$2,500,000; to church, \$18,000; to Woodman Art Gallery, \$1,300,000.
- Smith, Ellen M. G., Worcester, Mass., will to church, \$54,366.
- Smith, Lavina E., Philadelphia, Pa., will to charity, \$6000.
- Smith College, gift by Mr. and Mrs. D. B. Gamble, \$60,000; by various donors, \$32,306.
- Snow, Marie H., Rochester, N. Y., will to church, \$5000; will to Rochester University, \$10,000.
- Solano, Ella B., Los Angeles, Cal., gift to Southwestern Museum, Los Angeles, Cal., \$30,000.
- Southern An. Company, gift to Memphis Y. M. C. A., \$15,000.
- Southern Association of Yale Clubs, gift to Yale University, \$15,000.
- Southern Illinois Methodist Conference, gift to McKendree College, \$25,000.
- Southwestern Museum, Los Angeles, Cal., gift by unnamed donor, \$20,000; by Ella B. Solano, \$30,000.
- Southwestern University, gift by E. R. Burkholder, \$10,000.
- Spalding, Archbishop, Peoria, Ill., will to charity, \$100,000.
- Spaulding, Mrs. Keith, Chicago, Ill., gift to Sacha Memorial Hospital, \$5000.
- Sprague, Emily C., Brockton, Mass., will to charity, \$14,000.
- Sprague, Nancy A., Chicago, Ill., will to hospital, \$5000.
- Springer-Oliver, Mrs. M. W., Chicago, Ill., gift to Muncie Normal Institute, \$15,000.
- State Industrial School for Girls, will by W. C. Cupp, Eaton Rapids, Mich., \$7000.
- State University, Lexington, Ky., will by Mary E. Muir, \$55,000.
- Steger, John V., Chicago, Ill., will to charity, \$50,000; to education, \$25,000.
- Stenson, Ella L., Philadelphia, Pa., will to church, \$5756.
- Stevens, Ellen C., New York, will to charity, \$100,000.
- Stevens Institute of Technology, gift by W. H. Walker, \$125,000.
- Stewart, A. M., New York, will to charity, \$62,500.
- Stotesbury, Edwin T., Philadelphia, Pa., gift to charity, \$75,000.
- Straus, Mr. and Mrs. Nathan, New York, gift to charity, \$50,000.
- Straus, Mrs. Oscar S., New York, gift for girls' home, \$150,000.
- Strickles, S. L., Boggstown, Ohio, gift to schools, \$8000.
- Stuart, E. S., Fairview, Ky., gift to hospital, \$40,000.
- Stump, Cora F., Columbus, Ohio, will to church, \$5000.
- Sunday, Billy, gift to charity, \$6000.
- Susan-Fenimore Cooper Foundation, Cooperstown, N. Y., gift by various donors, \$90,865.
- Suydam, Lambert, New York, will to charity, \$15,000.
- Swan, Marie, Philadelphia, Pa., gift of fountain to city, \$300,000.
- Swarthmore College, will by J. K. Taylor, \$10,000.
- Sweet, Thaddeus G., gift to Phoenix, N. Y., \$10,000.
- Swift, Mrs. G. F., Chicago, Ill., gift to Northwestern University, \$5000.
- Swift & Co., Chicago, Ill., gift of pension fund to employees, \$2,000,000.
- Syracuse University, gift by Mrs. Russell Sage, \$15,000.
- Taft, Mrs. Charles P., gift to city of Cincinnati, \$100,000.
- Talcott, James, New York, gift to Berea College, \$10,000.
- Taylor, E. E., Brockton, Mass., gift to charity, \$18,000.
- Taylor, G. W., Decatur, Ill., gift to Methodist ministers' fund, \$30,000.
- Taylor, Jennie A., Hancock, Mass., will to library, \$6000.
- Taylor, J. K., Baltimore, Md., will to charity, \$150,000; will to Swarthmore College, \$10,000.
- Templeton, Thomas, Evanston, Ill., will to church, \$770,000.
- Tenbrook, Mary D., Philadelphia, Pa., will to charity, \$62,000; to library, \$10,000.
- Thaw, Mrs. William, Pittsburgh, Pa., gift to charity, \$5000.
- Thayer, Mary, Boston, Mass., will to church, \$7200.
- Thayer, Mrs. W. B., gift to Kansas City Art Institute, \$75,000.
- Thiel College, gift by Samuel C. Livingston, \$50,000.
- Thompson, Mrs. F. F., Canandaigua, N. Y., gift to charity, \$10,000.
- Thompson, James S., Tonawanda, N. Y., will to hospital, \$10,000; to church, \$20,000.
- Thompson, William, Philadelphia, Pa., will to charity, \$18,000; to church, \$51,000; to Kenyon College, \$30,000.
- Thorbourne, Emily, Patchogue, L. I., will to charity, \$10,000.
- Thuman, John, Union Hill, N. J., will to charity, \$100,000.
- Tilton Seminary, will by Aaron J. Robinson, \$35,000.
- Todd, William, New York, will to charity, \$25,000.
- Topeka, Kansas, gift to church by various donors, \$50,000.
- Topliff, E. M., Manchester, N. H., will to Dartmouth College, \$200,000.
- Torrey, J. L., Fruitville, Mo., will to Oneida Mountain Institute, \$10,000.
- Tourtelotte, J. F., Minneapolis, Minn., will to Tourtelotte High School, \$500,000.
- Tourtelotte High School, will by J. F. Tourtelotte, \$500,000.
- Troops on Mexican border, total contributions to, \$1,207,000.
- Trustees of Hospital, Chicago, gift to St. Luke's Hospital, \$120,000.
- Tuberculosis Hospital, New Orleans, La., gift by Mrs. John Dibert, \$200,000.
- Tuck, Elizabeth J., Augusta, Me., will to church, \$6000.
- Tucson, Ariz., gift of observatory by unnamed donor, \$60,000.
- Tulane University, gift by unnamed donor to Newcomb College, \$1,000,000; gift by various donors, \$70,000.
- Turner, Mrs. J. C., Jefferson, Ga., gift to church, \$10,000.
- Turner, Sarah F., Brookline, Mass., will to charity, \$25,000.
- Tuskegee Institute, will by Martha Andrews, \$50,000.
- Tyler, Roberta, Louisville, Ky., will to church, \$50,000.
- Union College, gift by Andrew Carnegie, \$5000; by various donors, \$245,000.
- Union Rescue Mission, Boston, Mass., gift by various donors, \$100,000.
- United Charities, Chicago, gift by Community Trust Company \$5000.
- United Hospital Fund, New York, gift by various donors, \$117,584.
- United States Steel Corporation, gift to hospital at Tokyo, \$10,000.
- University of the South, gift by various donors, \$546,000.
- Valparaiso University, gift by W. E. Pinney, \$50,000.
- Van Brunt, Willard A., Horicon, Wis., gift to charity, \$200,000.
- Van Clare, Mrs. S. M., Philadelphia, Pa., gift to Woman's Medical College, \$5000.
- Vanderbilt, Mrs. A. G., New York, gift to Post-Graduate Hospital, \$100,000.
- Vanderbilt, W. K., New York, gift to hospital, Aiken, S. C., \$12,500.
- Vanderbilt University, gift by various donors, \$825,000.
- Vanneck, John T., New York, will to charity, \$100,000.
- Vilas, Charles, Madison, Wis., gift to Madison Zoo, \$15,000.
- Virginia Christian College, gift by various donors, \$30,000.
- Virginia Home for Incurables, gift by Mary B. Newton, \$25,000.
- Virginia University, gift by unnamed donor, \$250,000.
- Vorhis, Hettie K., Winchester, Ind., gift to Home for Aged, \$60,000.
- Vroman, A. C., Pasadena, Cal., will to public library, \$5000.
- Wakefield, Mass., gift to library by various donors, \$15,000.
- Walker, Ella M., Chicago, Ill., will to charity, \$67,000; to University of Michigan, \$22,000.
- Walker, Mrs. H. H., Chicago, Ill., gift to St. Luke's Hospital, \$25,000.

- Walker, Matthew, Salt Lake City, Utah, will to orphan nursery, \$10,000.
- Walker, W. H., New York, gift to Stevens Institute of Technology, \$125,000.
- Wanamaker, John, Philadelphia, Pa., gift to Salvation Army, \$10,000.
- Ward, A. L., Fairmont, Minn., gift to Orphans' Home, \$45,000.
- Warner, W. W., Madison, Wis., gift to city, \$100,000.
- Warren, Rebecca, Boston, Mass., will to charity, \$97,700; to church, \$50,000; to Meadville Theological Seminary, \$55,000.
- Washington and Lee College, gift by Mrs. R. P. Doremus, \$100,000.
- Washington University, gift by Rockefeller General Education Board, \$250,000.
- Watson, Mrs. H. W., Philadelphia, Pa., will to church, \$100,000.
- Watson, Margaret H. W., Pittsburgh, Pa., will to home for crippled children, \$2,500,000.
- Webster, Charles B., New York, will to charity, \$10,000; to home for working girls, \$400,000.
- Webster, George H., Chicago, Ill., will to charity, \$10,000.
- Wellesley College, gift by various donors, \$301,669.
- Wells College, gift by various donors, \$338,000.
- Werden, Herbert E., Chicago, Ill., will to church, \$5,000.
- Wesleyan University, gift by Martha A. Buck, \$200,000.
- West, Eliza J., Philadelphia, Pa., will to church, \$45,000.
- Western College for Women, gift by Miss McElvev and Mrs. J. B. Wright, \$50,000; by various donors, \$188,500.
- Western Reserve University, gift by O. C. Barber, \$3,000,000; by various donors, \$7,000.
- Westminster College, gift by unnamed donors, \$110,000; will by James G. Butler, \$25,000.
- West Pennsylvania Institute for the blind, gift by various donors, Pittsburgh, Pa., \$80,000.
- Wharton, Mary L., Philadelphia, Pa., gift to Woman's Medical College, \$5,000.
- Wheeler, Clara M., Nashua, N. H., will to Home for Aged Women, \$5,000.
- Wheeler, Mrs. Sarah, Chicago, Ill., gift to charity, \$25,000.
- Wheelock, Alice T., New York, will to Columbia University, \$5,000.
- Whipple, Amos H., Boston, Mass., will to library, \$15,000.
- Whitall, William H., Philadelphia, Pa., will to charity, \$19,500.
- White, Armenia S., Concord, N. H., will to charity, \$13,500.
- White, Hannah A., Cincinnati, Ohio, gift to Earlham College, \$5,000.
- White, J. William, Philadelphia, Pa., will to University of Pennsylvania, \$164,000.
- White, Margaret S. R., New York, will to church, \$5,000; provisional bequest to Protestant Episcopal foundation, \$200,000.
- Whittaker, Horace, Visalia, Cal., gift to University of California, \$250,000.
- Whittaker, W. E., will to Mercer Hospital, Trenton, N. J., \$123,801.
- Wick, Henry R., Youngstown, Ohio, will to city park and art gallery, \$1,000,000.
- Willard, Caroline, Auburn, N. Y., will to charity, \$300,000; to church, \$300,000; to colleges, \$170,000.
- Williams, Hobart, Cheshire, Conn., gift to Chicago, Y. M. C. A., \$100,000; to St. Luke's Hospital, \$200,000; to University of Chicago, \$2,500,000; to other schools and charities, \$2,000,000.
- Wilson, Caroline A., New York, will to charity, \$55,000.
- Wilson, Florence J., Arkadelphia, Ark., will to church, \$10,000; to Conchita College, \$20,000.
- Wilson, Marie S., Philadelphia, Pa., will to charity, \$5,000; will to church, \$5,000.
- Wilson, W. H., Evanston, Ill., gift to Northwestern University, \$10,000; to pastors' pension fund, \$5,000.
- Wimpfheimer, Charles A., New York, gift to Mt. Sinai Hospital, \$880,000.
- Windship, George, Atlanta, Ga., gift to Emory University, \$60,000; will to charity, \$15,000; to church, \$5,000; to Emory University, \$70,000; to Reinhard School, \$5,000; to Young Harris College, \$50,000.
- Winona Federated Schools, gift by W. C. Biederwolf, \$20,000; by E. O. Excell, \$20,000; by unnamed donor, \$12,000.
- Wisconsin, University of, will by George T. Burrows, \$250,000.
- Wisconsin Methodists to Non-Sectarian School of Religion, \$150,000.
- Wisconsin Wesleyan College, gift by unnamed donor, \$10,000.
- Witter, Emily, Grand Rapids, Mich., will to hospital, \$10,000.
- Wofford College, S. C., gift by various donors, \$56,000.
- Wolf, Harris, Battle Creek, Mich., will to charity, \$10,950.
- Women's Club, Chicago, Ill., gift by unnamed donor, \$10,000.
- Woman's Medical College, gift by Mrs. S. M. Vanciare, \$5,000; by Mary L. Wharton, \$5,000.
- Woodman Art Gallery, will by Charles K. Smith, \$1,300,000.
- Wright, Isabella, Corydon, Ind., will to church, \$10,000.
- Wright, Mrs. W. J., Boston, Mass., gift to Rutgers College, \$10,000.
- Wrigley, William, Chicago, Ill., gift to charity, \$5,000.
- Yale University, gift by C. W. Harkness, \$500,000; by various donors, \$1,805,783; will by Charles W. Harkness \$500,000; will by Mary Harkness, \$300,000; will by Ellen P. Kellogg, \$5,000; gift by Robert M. Kelly, \$125,000; by Southern Assoc. of Yale Clubs, \$15,000.
- Young Harris College, will by George Windship, \$50,000.
- Y. M. C. A., gift to University of Minnesota, \$60,000.
- Y. M. C. A., gift by Merck Co., \$25,000; by William Moesman, \$50,000; by Rockefeller Foundation, \$115,000; by Julius Rosenwald, \$25,000; by various donors, \$539,107; gift by Hobart Williams, \$100,000; will by Henry Dexter, \$258,936.
- Y. M. C. A., Bath, Me., gift by various donors, \$10,000; Chelsea, Mass., gift by various donors, \$45,000; Fort Wayne, Ind., gift by various donors, \$250,000; Madison, Wis., gift by various donors, \$150,000; Memphis, Tenn., gift by Southern An. Company, \$15,000; Mobile, Ala., gift by various donors, \$7,000; St. Louis, Mo., gift by unnamed donor, \$25,000; San Francisco, Cal., by various donors, \$40,000; Worcester, Mass., gift by various donors, \$360,000.
- Young Men's Hebrew Association, St. Louis, Mo., gift by various donors, \$20,000.
- Y. W. C. A., gift by G. R. Cooley, \$10,000; by John D. Rockefeller, \$500,000.
- Y. W. C. A., Beaumont, Texas, gift by unnamed donors, \$50,000; Hartford, Conn., gift by various donors, \$300,000; Indianapolis, Ind., gift by various donors, \$200,000; Portland, Ore., gift by various donors, \$9650; San Francisco, Cal., gift by various donors, \$350,000; Titusville, Pa., gift by unnamed donor, \$86,000; Worcester, Mass., gift by various donors, \$70,000.
- Zion fund, gift by various donors, Chicago, Ill., \$10,000.
- Zionist Movement, gift by Louis D. Brandeis, \$6,000; by Mrs. Joseph Fels, \$1,000,000.
- See also HOSPITALS.

**GILDER, JEANNETTE LEONARD.** An American editor and author, died in New York City, Jan. 17, 1916. Born at St. Thomas Hall, a school for girls at Flushing, L. I., conducted by her father, Miss Gilder entered newspaper work at 18 on the Newark *Morning Register*, became Newark reporter for the New York *Tribune*, and later was associated with her noted brother, Richard Watson Gilder, in editing *Scribner's Monthly*, which became the *Century*. With another brother, Joseph B. Gilder, she founded in 1881 the *Critic*, a literary journal, of which she was associate editor, until it became *Putnam's Magazine* in 1906. Previously, for five years, she had been connected with the New York *Herald*, as literary, musical, and dramatic critic, and for many years she was retained as correspondent by important papers in other cities. Latterly Miss Gilder had been editor and owner of the *Reader*, a guide to new books, and she had also placed manuscripts for authors, among whom she had a large acquaintance. Besides editing various books, she wrote *The Autobiography of a Tomboy* (1900) and *The Tomboy at Work* (1904).

**GINZBERG, ASHER.** See JEWS AND JUDAISM, *Literary Events*.

**GIORGI, ORESTES.** See ROMAN CATHOLIC CHURCH

**GLANDERS.** See VETERINARY MEDICINE.

**GLAZE.** See METEOROLOGY.

**GOLD.** With a gold production for the United States and colonies of \$92,315,363 in 1916 as compared with \$101,035,700 in 1915,

there was a corresponding decline in other countries so that the total production was expected to fall below the figure of \$473,134,590 for 1915, which, with a single exception, namely, 1912, recorded the high water point in the world's gold production. Australasia supplied less in 1916 than in the previous year and a provisional estimate of \$39,606,440 was made at the end of December. The same condition held true for the Transvaal, whose production was tentatively stated at \$186,854,445, while Japan, exclusive of Chosen, produced about \$2,911,392. Canada also showed a decreased production over 1915. While gold was greatly needed by the belligerent countries as shown by great activity on the Rand, yet the most important effects of the war were felt in the commercial movement of this precious metal. In the United States enormous gold reserves were accumulated so that on Nov. 1, 1916, the gold coin and bullion in the United States was \$2,700,136,976 or an increase of \$714,597,804 in 16 months. More gold was accumulated than ever before had been held by any other country in the world. In Sweden, Norway, and Holland the state banks were unable to coin all the gold offered and were permitted to accept bullion for deposit. In Australia the prohibition of the export of gold was removed in April, but the treasury retained supervision of all exports. In Great Britain the melting or use of current gold coin other than as currency was forbidden by an order in council of July 28th, and throughout the year gold was exported to the United States largely through Canada. From December, 1914, to December, 1916, the United States received net imports of gold equivalent to the production of the remainder of the world and in addition was able to retain all of its own domestic production. The vast amount of gold in the United States was looked upon as a possible source of commercial danger to American prosperity, for under the banking system recently established much less gold was required to insure a normal volume of credits than previously.

The gold production in 1915 exceeded all previous records. It amounted to 4,887,604 fine ounces, valued at \$101,035,700, compared with a value in 1914 of \$94,531,800. Two States, California and Colorado, produced over 1,000,000 fine ounces. California led by a slight margin. Alaska produced 808,345 fine ounces, valued at \$15,710,000. The value of the output of Nevada was \$11,883,700. The following table gives the production of gold in the States and Territories in 1915.

State or Territory	Fine ounces	Gold Value
South Dakota	858,145	7,403,500
Tennessee	329	6,800
Texas	87	1,800
Utah	189,045	3,907,900
Vermont	.....	.....
Virginia	24	500
Washington	22,830	461,600
Wyoming	672	13,900
Total	4,887,604	\$101,035,700

The production in 1916 exceeded the record production of 1915. See FINANCIAL REVIEW: METALLURGY.

**GOLD COAST.** A British crown colony and protectorate, with Ashanti and the Northern Territories, situated on the Gulf of Guinea, having the Ivory Coast (French) on the west, and Togoland (German) on the east. Area of the colony, 24,200 square miles; of Ashanti, 20,000; of the Northern Territories, 35,800—total, 80,000. The returns of the 1911 census place the population of the colony at 853,766; Ashanti, 287,814; Northern Territories, 361,806; but the figures are believed to understate the actual number of inhabitants. Accra, the capital, had (1911) 19,585 inhabitants; Coomassie, 18,853; Cape Coast Castle, 11,364; Secondee, 7725. The chief products and exports (1914) are cacao, £2,193,740; gold and gold dust, £1,687,645; rubber, £21,631; palm kernels, £88,671; palm oil, £37,646; lumber, £240,878; kola nuts, £142,190. Cotton goods, provisions, and wine and spirits are the main imports. Total trade (1914): £4,456,968 imports, £4,942,656 exports. Revenue, £1,331,713; expenditure, £1,755,850. Tonnage entered and cleared, 2,812,025. A railway runs from Secondee to Coomassie, 168 miles. A railway under construction from Accra to Akwapim, is open for traffic to a temporary terminus at Koforidua, about 51 miles distant. The northern extension from Koforidua has been begun, but work has been temporarily suspended.

**GOLF.** Charles E. Evans, Jr., of Edgewater, N. J., was the most conspicuous figure in the golfing world during the year 1916. He performed the extraordinary feat of capturing both the national amateur and the national open championships. Only once before in the history of the sport has an amateur accomplished this. Twenty-six years ago John Ball, of the Holyake Club, won both the amateur and open titles of Great Britain.

The women's national championship went to Miss Alexa Stirling, of Atlanta, Ga. She is only 17 years old. Mrs. Clarence H. Vanderbeck, holder of the title in 1915, did not defend her laurels, but Miss Stirling had the satisfaction of defeating the Philadelphia player in an invitation tournament at the Huntingdon Valley Club before the national championships were held.

The year was noteworthy for the fine showing made by young followers of the game. Aside from Miss Stirling, Robert Jones, 14 years old, also of Atlanta, Vincent Hilton, of the Metropolitan district, and Norman H. Maxwell, of Philadelphia, distinguished themselves. Jones succeeded in reaching the third round in the amateur tourney, only to be defeated by Robert A. Gardner, the 1915 amateur champion. Hilton won the metropolitan junior honors at Englewood, N. J., and Maxwell defeated, among others, Max R. Marston and Gardiner White,

State or Territory	Fine ounces	Gold Value
Alabama	247	\$5,100
Alaska	808,346	16,110,000
Arizona	220,392	4,555,900
California	1,090,781	22,547,400
Colorado	1,089,928	22,530,800
Georgia	1,684	34,800
Idaho	56,628	1,170,600
Illinois	.....	.....
Michigan	.....	.....
Montana	240,825	4,978,800
Missouri	.....	.....
Nevada	574,874	11,883,700
New Mexico	70,632	1,460,100
North Carolina	8,258	170,700
Oregon	90,321	1,867,100
Philippine Islands	63,895	1,320,900
Porto Rico	84	700
South Carolina	174	3,600

Another name deserving of special mention is James M. Barnes of the Whitemarsh Club, England, who, although unsuccessful in winning the national title, led a big field home in the first annual tournament of the Professional Golfers' Association of America.

The winners of the leading tournaments of the year were: United States Amateur, Charles E. Evans, Jr.; United States Open, Charles E. Evans, Jr.; United States Women, Miss Alexa Stirling; Metropolitan Amateur, Oswald Kirkby; Metropolitan Open, Walter C. Hagen; Metropolitan Women, Mrs. Q. F. Feitner; Metropolitan Junior, Vincent K. Hilton; Western Amateur, Heinrich Schmidt; Western Women, Mrs. F. C. Letts, Jr.; Western Junior, Jack Simpson; New Jersey, Oswald Kirkby; Southern Amateur, Reuben G. Bush; Southern Women, Miss Alexa Stirling; Southern Open, James M. Barnes; Women's Eastern, Mrs. W. A. Gavin.

Princeton won the intercollegiate team championship, defeating Harvard by 9 matches to 0. The individual title went to James W. Hubbell of Harvard, who defeated D. C. Corkran, of Princeton, 1 up on the 36th hole. The Western intercollegiate championship was won by the University of Illinois.

A résumé of the year would be incomplete if it did not make reference to the marvelous growth in popularity of the game of golf. New courses and clubs came into existence in all parts of the United States and in the larger cities new public links were made necessary to meet the extraordinary demand for such facilities.

**GOLTZ, KOLMAR, BARON VON DER.** A German soldier, died April 19, 1916, at the headquarters of the First Turkish army. It was officially announced that his death was caused by spotted fever, but a report was current that he had been killed by Turks disaffected at German dictation in Turkey. Born in 1843, at Bielkenfeld, East Prussia, and educated for a military career, he served in the Austro-Prussian and Franco-Prussian wars. In the latter, as commander of the Second army, he took part in several important battles. But he became best known for his work in Turkey, where he spent the years 1883-96 in reorganizing the Ottoman army, and whither he was called in 1908 to continue this work. By 1911 he had risen to the rank of general and field marshal in the German army, and he saw service in various important posts. After the German forces had entered Belgium in 1914, von der Goltz was placed in charge as military governor of Brussels. In November of the same year he was sent to Turkey as commandant at Constantinople, and he was largely responsible for the Turkish defense of the Gallipoli peninsula. As chief of the First Turkish army, after April, 1915, he had been engaged in operations in Asiatic Turkey. He was famous as a strategist and had written several books on military subjects, the most notable of which was *The Nation in Arms* (1883).

**GOMME, SIR (GEORGE) LAURENCE.** An English public official and antiquary, whose death at Long Crendon, Buckinghamshire, was announced Feb. 25, 1916. He was born at Hammersmith (London) in 1853, and all his life till his retirement in 1914 was identified with the life of the British capital. After studying at the City of London School, he entered the

Metropolitan Board of Works, and in 1891 was appointed statistical officer to the London County Council. From 1900 to 1914 he was clerk of the council. In 1911 he was knighted. Sir Laurence Gomme was largely instrumental in efforts to preserve the features of Old London, and he had gone deeply into the historical and antiquarian lore of the city. Deeply interested also in the wider field of folklore, he had founded the Folklore Society, become a fellow of the Anthropological Society, and edited the *Folklore Journal*, besides the *Antiquary* and the *Archaeological Review*. His writings include: *Primitive Folk-Moots* (1880); *Ethnology in Folklore* (1892); *The Making of London* (1911); *London* (1914).

**GONCOURT PRIZE.** See FRENCH LITERATURE.

**GONZALEZ BESADA, AUGUSTO.** See SPANISH LITERATURE.

**GOODRICH, JAMES P.** Elected Republican Governor of Indiana, Nov. 7, 1916.

**GÖRGEY, ARTHUR.** An Hungarian soldier, died at Budapest, May 21, 1916, at the age of 98. He was born in 1818 of a noble family of Saxony. At the outbreak of the Hungarian War of Liberation in 1848 he was commissioned a captain in the revolutionary army, and after winning a number of victories over the Austrians was made commander-in-chief. Kossuth resigned as dictator Aug. 11, 1849, after Russia had come to the support of Austria, and Görgey succeeded him. Two days later, however, Görgey was forced to surrender to the Russians. He was confined at Klagenfurt, Austria, but was released. The Hungarians were bitter against him for his surrender, but he took this action to save his men from being overwhelmed by five armies. As a sort of *apologia* he published a book translated into English as *My Life and Acts in Hungary, 1848-49* (1852). Görgey afterward became known as a chemist and railway engineer, but for many years had retired from public life.

**GOBIZIA.** See WAR OF THE NATIONS.

**GORST, SIR JOHN ELDON.** A British politician, died in London April 4, 1916. He was born at Preston in 1835, graduated from St. John's College, Cambridge, in 1857, and after several years as an inspector of schools at Wai-kato, New Zealand, returned and was called to the bar in 1865. During several periods he was a member of Parliament, in 1866-68 for Cambridge, in 1875-92 for Chatham, and again in 1892-1906 for Cambridge. He also held various offices, solicitor general, under secretary for India, and financial secretary to the Treasury—all as a Conservative. Gorst, who had been knighted in 1885, had become known for an independence in politics which led him often to oppose his own party, and which made him a prominent member of the noted Fourth Party of the early eighties. On his failure to be returned to Parliament in 1906, he came out as a Liberal, after 50 years of connection with the Conservatives, and devoted himself to problems of social reform. In 1909 he stood for Preston, but was defeated. He published in 1907 *The Children of the Nation* (he had been prominent in educational matters) and in 1908 *New Zealand Revisited*.

**GORZ AND GRADISCA.** A crownland of Austria. Area, 1127 square miles; population, 1910, 260,721.

**GOTTI, GIROLAMO MARIA.** An Italian cardinal and prefect of the Propaganda, died in Rome March 19, 1916. He was born in Genoa in 1834. Although the son of a dock laborer, he was enabled to study for the Church, and for 20 years was a Carmelite monk, living a most austere life. His scholarship and teachings eventually brought him to the attention of Pope Leo XIII, who gave him a post at the Vatican, and who later sent him to Brazil to bring the prelates there into harmony with the new republican government. He had been archbishop for some years, when in 1895 he was created cardinal. On the death of Cardinal Ledochowski in 1902, Cardinal Gotti succeeded him as prefect of the Propaganda, and Pope Leo is supposed to have desired him as his successor on the papal throne.

**GOUCHER COLLEGE.** A non-sectarian institution for the education of women, at Baltimore, Md. It was founded in 1885. In the fall of 1916 there were 616 students and 43 members in the faculty. Benefactions amounting to about \$160,000 were received during 1916. The college possesses in productive funds \$1,000,000, and during the year drew a net income from all sources of \$123,635. The library contains 25,000 volumes. President, William W. Guth.

**GOVERNMENT.** See section so entitled under various countries.

**GOWER, LORD RONALD SUTHERLAND.** An English sculptor and writer on art and other subjects, died March 9, 1916, at Tunbridge Wells. A younger son of the second Duke and twentieth Earl of Sutherland, and of his wife, who was famous in her day as a friend of Queen Victoria and as a political influence, Lord Ronald was born at Stafford House in 1845. After an education at Eton and at Trinity College, Cambridge, from which he did not graduate, he sat in Parliament as Liberal member for Sutherlandshire from 1867 to 1874, but had no liking for political life. When free, he gave himself to travel and to the study of art history and the practice of sculpture. In the latter field he is best known for his Shakespeare monument at Stratford. As an art critic, he wrote a guide to the pictures of Holland and numerous books on the painters of the English school. He also published historical works such as *Life of Joan of Arc*, *Last Days of Marie Antoinette*, and *History of the Tower*; but the volumes in which he discussed agreeably the famous people whom he had known (his family were connected with most of the important titled families of England) were most popular. These include *Old Diaries* (1902) and *Records and Reminiscences* (1903). His last book was *Stafford House* (1910).

**GOYESCAS.** See MUSIC, *Opera*.

**GRADE CROSSING PROTECTION.** See RAILWAY ACCIDENTS.

**GRAHAM, HOBACE F.** Elected Republican Governor of Vermont, Nov. 7, 1916.

**GRAIN STANDARDS ACT.** See AGRICULTURE.

**GRANADOS, ENRIQUE.** A Spanish pianist and composer, died in escaping from the *Sussex*, a vessel which, while crossing the English Channel, was torpedoed by a German submarine March 24, 1916. Señor Granados was on his way back to Spain with his wife (who was also lost), after a visit to the United States, during which he attended the world première

of his opera *Goyescas*, which was produced by the Metropolitan Opera Company on the preceding January 28th. He was born at Lerida, Catalonia, in 1867, studied music in Spain under Bautista Pujol and Felipe Pedrill, and at 20 went to Paris, where Charles de Bériot was his teacher in pianoforte. His first opera, *Maria del Carmen*, was presented at the Royal Theatre, Madrid, in 1898, part of *Foletto*, a second opera, was given at Barcelona in 1903, and, also in the latter city, *Liliana* was produced in 1911. Before this date he had also composed other works for orchestra, instrumental trios and quartets, songs, and pianoforte solos. The opera *Goyescas*, based on a number of pianoforte solos, was to have been presented at the Grand Opéra in Paris, when the war interfered. The first opera ever sung in Spanish in New York, it pleased both many critics and the public by its novelty, distinctly national quality, and melodiousness. As a pianist, Señor Granados appeared in recital several times in New York, and also in Washington at the White House. See MUSIC, sections *Artists*, *Instrumentalists*, *Chamber Music*, and *Opera*.

**GRANDFATHER CLAUSE.** See ELECTORAL REFORM.

**GRAND OPÉRA.** See MUSIC, *France*.

**GRAND PRIX DE LITTÉRATURE.** See FRENCH LITERATURE.

**GRAPHITE.** The greater part of the graphite used in the United States is imported. Approximately 19 per cent was produced from domestic sources in 1915. In addition to natural graphite the United States produced a considerable quantity of manufactured graphite in the electric furnaces of Niagara Falls. The imports came chiefly from the island of Ceylon. The greater part of crystalline graphite is produced in New York, Pennsylvania, and Alabama. A small quantity is also produced in Montana. As a result of the increased production in all these States the quantity of crystalline graphite produced in 1915 exceeded that of any previous year. The total amount produced in 1915 was 4718 short tons, valued at \$429,639, compared with 4336 tons, valued at \$324,118 in 1914. The imports of graphite in the United States in 1915 amounted to 23,075 short tons, valued at \$2,241,163. At noted above, the largest amount comes from Ceylon, but considerable quantities are also imported from Canada, Japan, and Mexico.

**GREAT BRITAIN.** THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND. A constitutional monarchy. The capital is London, in England, on the river Thames. The term "Great Britain" is often used to mean "United Kingdom"; properly Great Britain is the large island consisting of England, Wales, and Scotland. Also "England," especially when referring to the government, is sometimes used to mean "United Kingdom." England and Wales in many respects are regarded as a single division of the United Kingdom. The United Kingdom and its possessions, that is, all territories subject to the ultimate control of the Parliament at London, constitute the British Empire. Attached to the United Kingdom, but regarded neither as parts of it nor yet as colonies, are the Isle of Man and the Channel Islands.

**AREA AND POPULATION.** The area of the United Kingdom, including inland water, is

stated at 121,331 square miles; with the Isle of Man and the Channel Islands, 121,633 square miles. The latter area is about 58.2 per cent of the area of Germany, or somewhat less than the combined areas of New England, New York, and New Jersey (123,852 square miles). England and Wales comprise 58,340 square miles (land, 58,029); Scotland, 30,405 square miles (land, 29,796). Slightly differing figures for area are issued, in statute acres, each year by the Board of Agriculture and Fisheries; for such figures, published in 1915, see section *Agriculture* below. The following table shows by divisions the area, in square miles, the population present according to the census of April 3, 1911, the density per square mile in 1911, and the population as estimated June 30, 1914 (the 1914 figure for England and Wales is a reestimate):

	1911			
	Sq. m.	Pop.	Dens.	Pop. 1914
England * . . . . .	50,874	84,045,290	669	86,966,684
Wales . . . . .	7,466	2,025,202	271	
Scotland . . . . .	30,405	4,760,904	156	4,747,167
Ireland . . . . .	32,586	4,890,219	135	4,881,898
U. Kingdom . . . . .	121,331	45,221,615	373	46,089,249
Isle of Man . . . . .	227	52,016	229	
Channel Islands . . . . .	75	96,889	1,292	
Total . . . . .	121,633	45,370,580	374	

\* Including Monmouthshire.

The population figures represent persons present and therefore do not include British soldiers, sailors, and merchant seamen abroad. The estimated population of the United Kingdom on June 30, 1914 (46,089,249) was about 68 per cent of the estimated population of Germany on the same date (67,810,000).

According to census returns, the population of England, Wales, and Scotland has steadily increased; the rural population of Scotland, however, is practically stationary. In Ireland, the census of 1841 showed the maximum population. Various census returns for England and Wales, Scotland, Ireland, and the United Kingdom:

	E. & W.	Scot.	Ire.	U. K.
1841 . . . . .	15,914,148	2,620,184	8,196,594	26,730,929
1861 . . . . .	20,066,224	3,062,294	5,798,967	28,927,485
1881 . . . . .	25,974,439	3,735,578	5,174,896	34,884,848
1901 . . . . .	32,527,848	4,472,108	4,458,775	41,458,721
1911 . . . . .	36,070,492	4,760,904	4,890,219	45,221,615

England's percentage of the population of the United Kingdom increased from about 58.1 in 1841 to 75.3 in 1911; that of Wales, from 3.4 to 4.5; Scotland, 9.8 to 10.5; while Ireland's percentage decreased from 30.7 to 9.7. In England the percentage of increase in 1891-1901 was about 12.1 and in 1901-11 about 10.5; in Wales, 13.3 and 18.1; in Scotland, 11.1 and 6.5; in Ireland, decrease 5.2 and 1.5; United Kingdom, increase 9.9 and 9.1.

Number of males and females respectively in 1911: England, 16,421,298 and 17,623,992 (1073 females to 1000 males); Wales, 1,024,310 and 1,000,892 (977); Scotland, 2,308,839 and 2,452,065 (1062); Ireland, 2,192,048 and 2,198,171 (1003); United Kingdom, 21,946,495 and 23,275,120 (1061).

Returns of the 1911 census in respect of occupations are shown in the tables below. For

England, Wales, and Scotland, the occupational statistics exclude persons under 10 years of age, while for Ireland they include the total population.

England & Wales	Males	Females	Total
Government . . . . .	248,624	50,975	299,599
Defense . . . . .	205,817		205,817
Professional . . . . .	367,578	847,043	714,621
Domestic . . . . .	887,677	1,784,040	2,121,717
Commercial . . . . .	2,062,710	151,321	2,214,031
Agricultural and fishing . . . . .	1,165,654	94,822	1,260,476
Industrial . . . . .	7,015,605	2,452,533	9,468,138
Unoccupied and unspecified . . . . .	2,208,585	10,026,379	12,234,914
Total . . . . .	18,662,200	14,857,113	28,519,313

Scotland	Males	Females	Total
Government and defense . . . . .	42,476	4,932	47,408
Professional . . . . .	45,718	35,962	81,675
Domestic . . . . .	54,488	166,578	201,066
Commercial and transport . . . . .	245,621	37,844	283,465
Agricultural and fishing . . . . .	198,731	33,380	227,111
Industrial . . . . .	911,728	314,514	1,226,242
Unoccupied and non-productive . . . . .	309,024	1,388,410	1,647,434
Total . . . . .	1,782,781	1,931,620	3,714,401

Ireland	Males	Females	Total
Professional . . . . .	108,603	37,531	141,134
Domestic . . . . .	25,831	144,918	170,749
Commercial . . . . .	101,396	9,747	111,143
Agricultural . . . . .	721,669	59,198	780,867
Industrial . . . . .	434,699	178,698	613,397
Indefinite and non-productive . . . . .	804,850	1,768,079	2,572,929
Total . . . . .	2,192,048	2,198,171	4,390,219

In England and Wales, in 1911, the population of urban districts was 28,162,936 and of rural districts 7,907,556. The percentage in urban districts in 1911 was 78.1, as compared with 77.0 in 1901, 72.0 in 1891, 67.9 in 1881, and about 50.2 in 1851. England and Wales in 1911 had 97 urban districts (including the administrative county of London as one district) with a population exceeding 50,000 each. The population of these districts totaled 17,251,009, the increase per cent in 1901-11 having been 8.3, as compared with 15.3 in 1891-1901. London, that is, the administrative county, had in 1911 4,521,685 inhabitants; it covers an area of 117 square miles, and its population showed a decrease of 0.3 per cent since 1901. Greater London includes the administrative county and a wide belt of suburban towns and districts known as the "outer ring." The area of the outer ring is 576 square miles; its population in 1911, 2,720,673. Greater London thus has an area of 693 square miles, with a population of 7,251,358 in 1911, the increase per cent in 1901-11 having been 10.2, as compared with 16.8 in 1891-1901. In 1911, the population of the larger cities of England and Wales, after London, with increase per cent over 1901, was as follows: Birmingham, 525,833 (0.5)—with districts annexed Nov. 9, 1911, 840,202; Liverpool, 746,421 (6.0); Manchester, 714,333 (10.8); Sheffield, 454,632 (11.1)—with districts annexed April 1, 1912, 459,916; Leeds, 445,550 (3.9); Bristol, 357,048 (5.3); West Ham (in outer ring), 289,030 (8.1); Bradford, 288,468 (3.1); Kingston-upon-Hull, 277,991 (15.7); Newcastle-upon-Tyne, 266,603 (7.9); Nottingham, 259,904 (8.4); Stoke-on-Trent, 234,534 (9.2); Salford, 231,357 (4.7); Portsmouth, 231,141 (22.3); Leicester, 227,222 (7.4); Cardiff (in Wales), 182,259 (10.9); Bolton,

180,851 (7.5); Croydon (in outer ring), 169,551 (26.6); Willesden (in outer ring), 154,214; Rhondda (in Wales), 152,781; Sunderland, 151,159; Oldham, 147,483.

In Scotland, the larger municipal burghs, with population in 1911 and increase per cent over 1901, are: Glasgow, 784,455 (1.1); Edinburgh, 320,315 (0.9); Dundee, 165,006 (1.2)—with Broughty Ferry, annexed in 1913, 176,062; Aberdeen, 163,331 (6.2); Govan, 89,725 (9.2); Paisley, 84,447 (6.4); Leith, 80,489 (3.9).

In Ireland, the population of Dublin in 1911 was 304,802—with suburbs, 403,030 (increase since 1901, 7.4 per cent); Belfast, 386,947; Cork, 76,673; Londonderry, 40,780; Limerick, 38,518.

The number of births, deaths, and marriages (that is, persons married) in 1913 and 1914:

		<i>Births</i>	<i>Deaths</i>	<i>Marriages</i>
England and Wales	1913	881,800	504,975	286,583
	1914	878,822	516,778	294,087
Scotland	1913	120,516	73,069	33,691
	1914	128,928	73,548	35,051
Ireland	1913	100,094	74,694	22,266
	1914	98,806	71,345	23,695
Total for United K.	1913	1,102,500	652,788	342,540
	1914	1,101,551	661,671	352,833

The total excess of births over deaths in 1913 449,762 and in 1914 439,880. It is interesting to note that in Germany the excess of births over deaths in 1913 was 833,800; the German birth rate in that year was 29.1, and the British, 24.1; the German death rate 15.8, and the British, 14.3. The rate, per thousand inhabitants, of births, of deaths, and of marriages (that is, persons married) is shown in the following table:

		<i>E. &amp; W.</i>	<i>Scot.</i>	<i>Ire.</i>	<i>U. K.</i>
Birth rate	1904	28.0	29.1	23.6	27.7
	1909	25.8	27.3	23.4	25.7
	1912	23.9	25.9	23.0	24.1
	1913	24.1	25.5	22.8	24.1
	1914	23.8	26.1	22.6	23.9
Death rate	1904	16.3	17.1	18.0	16.6
	1909	14.6	15.9	17.1	15.0
	1912	13.3	15.3	16.5	13.9
	1913	13.8	15.5	17.1	14.3
	1914	14.0	15.5	16.3	14.4
Marriage rate	1904	15.3	14.1	10.4	14.7
	1909	14.7	12.8	10.3	14.1
	1912	15.6	13.7	10.6	14.9
	1913	15.7	14.3	10.2	15.0
	1914	15.9	14.8	10.8	15.3

Number of passengers that arrived in or left the United Kingdom from or for countries out of Europe, distinguishing British and aliens (the last column shows the number of British passengers from and to the United States):

		<i>British</i>	<i>Aliens</i>	<i>Total</i>	<i>U. S.</i>
Arrivals	1904	144,581	92,172	*241,896	79,655
	1909	149,068	112,257	261,325	53,323
	1912	199,181	141,515	340,696	71,493
	1913	227,643	144,975	372,618	77,014
	1914	229,870	130,022	359,892	77,171
Departures	1904	271,485	174,354	*453,877	146,445
	1909	288,761	185,617	474,378	109,700
	1912	467,666	189,169	656,835	117,310
	1913	469,640	232,051	701,691	129,169
	1914	293,204	158,234	451,438	92,808

\* In 1904, 5143 arrivals and 8088 departures were not distinguished as either British or aliens.

Total arrivals in 1915 are reported at 147,354; departures, 126,505.

**PUBLIC EDUCATION.** The educational system is partly under state and local control and partly private. Elementary instruction is compulsory between the ages of 5 and 14 (but in many cases partial or total exemption is possible); it is provided free by the local authorities, aided by state grants. Secondary education is still largely of a private character, but considerable progress has been made in the organization of a public secondary-school system. The schools here treated are not to be confounded with the many private, and often expensive, institutions known as "the public schools."

In England and Wales, on July 31, 1914, accommodations in the ordinary public elementary schools numbered 7,004,007; pupils on the registers, 6,078,823 (of whom 4,982,342 under 12 years of age); percentage of average attendance to average number on registers, 88.73. Public secondary schools numbered 1027, with 187,207 full-time students. Figures for evening and similar schools are not available for 1914, but for the year ended July 31, 1913, there were 6876 such schools, with 798,881 students.

In Scotland, for the year ended Aug. 31, 1914, there were 3171 day primary schools in receipt of grants, accommodations for 1,058,809 pupils, 814,345 enrolled, and 728,270 in average attendance. Higher grade schools in receipt of grants numbered 195, with 41,029 accommodations, 26,655 pupils enrolled, and 25,913 in average attendance. Students in continuation classes, 151,855. Secondary schools claiming grant, 56, with 19,780 students enrolled and average attendance of 18,742.

In Ireland, primary schools in 1914 numbered 8207; accommodations, 777,046; pupils enrolled, 679,762; average attendance, 508,424.

**AGRICULTURE.** In 1916, crops in England and Wales were generally harvested late and were secured only in fair condition. Labor was very deficient, especially horsemen and men for thrashing. Women were largely employed at high wages for digging potatoes. Unfavorable weather and scarcity of labor for fall plowing and sowing indicated a decrease in the wheat area for 1917. The preliminary estimate of the 1916 wheat production in England and Wales was 55,540,472 bushels, about 12,000,000 bushels less than in 1915, but more than in 1912 or 1913; the yield per acre, 29 bushels, was about two bushels below that of 1915, and about 2.8 bushels below the average for 1906-15. The barley crop, estimated at 41,720,592 bushels, was nearly 5,600,000 bushels in excess of 1915. Oats were slightly better than in 1915, yielding 83,689,312 bushels, the largest production since 1910. The estimated yield of beans was 6,900,976 bushels, and of peas 2,081,032 bushels.

Each year the area of the United Kingdom is stated in statute acres by the Board of Agriculture. The figures vary slightly from year to year; the latest available place the total area (including the Isle of Man and the Channel Islands) at 77,720,341 acres, including rivers and lakes, but not including foreshore and tidal waters. The area of Great Britain (England, Wales, and Scotland) is stated at 56,800,463 acres; Ireland, 20,734,124; Isle of Man and the Channel Islands, 185,764. The cultivated area as reported for the first week of June, 1914, was 46,763,816 acres, as compared with 46,740,904 acres in 1913 and 47,670,997 in 1904; the culti-

vated area in 1914 was distributed as follows: Great Britain, 31,900,185 acres; Ireland, 14,742,766; Isle of Man and the Channel Islands, 120,865.

The table below shows the total acreage under principal crops in 1914 and the production in 1913 and 1914 (the figures for acreage include, while those for production exclude, the comparatively small returns of the Isle of Man and the Channel Islands):

	Acreage		Production	
	1914	1913	1913	1914
<b>Corn Crops:</b>				
Wheat	1,905,938	56,696,400	62,432,325	
Barley	1,873,280	65,682,531	64,525,424	
Oats	3,899,074	165,282,285	165,308,299	
Eye	66,890			
Beans	301,488	7,602,475	8,960,627	
Peas	169,938	3,385,877	2,992,303	
Total	8,216,603			
<b>Green Crops:</b>				
Potatoes	1,209,150	7,604,804	7,476,458	
Turnips and swedes	1,760,629	35,318,818	34,195,735	
Mangold	516,893	9,276,129	9,522,921	
Other	568,687			
Total	4,055,359			
<b>Other Crops, Grass, etc.:</b>				
Flax	49,882			
Small fruit	101,083			
Bare fallow	348,532			
Clover, sainfoin, and rotation grasses:				
For Hay	2,915,669	5,281,040	4,210,924	
Not for hay	8,690,377			
Permanent pasture:				
For hay	6,496,527	10,164,048	8,192,555	
Not for hay	20,853,123			
Hops	36,661	255,841	507,258	

\* Exclusive of heath or mountain land. † Cwt.

The following figures for live stock relate to England and Wales, June, 1915 and 1916 respectively: horses used for agricultural purposes, including mares for breeding, 729,080 and 772,770 (increase 6 per cent); unbroken horses, including stallions, one year and above, 209,770 and 227,170 (increase 8.3 per cent); same under one year, 99,240 and 109,810 (increase 10.7 per cent); other horses, 249,090 and 249,820 (increase 0.3 per cent); total horses, 1,287,180 and 1,359,570 (increase 5.6 per cent); cows and heifers in milk, 1,881,670 and 1,855,450 (decrease 1.4 per cent); total cattle, 6,064,150 and 6,215,780 (increase 2.5 per cent); sheep under one year, 7,169,190 and 7,307,050 (increase 1.9 per cent); total sheep, 17,522,580 and 17,951,120 (increase 2.4 per cent); swine, 2,420,030 and 2,167,940 (decrease 10 per cent).

The table below shows for Great Britain, for Ireland, and for the United Kingdom (including the Isle of Man and the Channel Islands) the number of live stock in the first week of June; the figures for horses include only those used for agriculture, unbroken horses, and brood mares:

	Horses	Cattle	Sheep	Swine
<b>Gt. Britain:</b>				
1913...	1,324,404	6,963,854	28,931,412	2,233,855
1914...	1,296,188	7,092,918	24,285,514	2,634,249
<b>Ireland:</b>				
1913...	541,341	4,982,625	8,620,724	1,060,360
1914...	546,369	5,051,645	3,600,581	1,305,688
<b>U Kingdom:</b>				
1913...	1,874,264	11,936,600	27,629,206	3,305,771
1914...	1,851,042	12,164,505	27,963,977	3,952,615

See AGRICULTURE; AGRICULTURAL EDUCATION; DAIRYING.

**MINING AND METALS.** By far the most important mineral mined is coal, and the most important metal is iron. Coal production in 1914 was 265,664,393 tons, spot value £132,596,853, as compared with 287,430,473 tons, £145,535,669, in 1913; iron ore in 1914, 14,867,582 tons, £3,921,683, as compared with 15,997,328 tons, £4,543,558, in 1913. The output of pig iron in 1914 was 8,923,773 tons, as compared with 10,260,315 tons in 1913. Of the latter amount, 5,138,058 tons were from British ores and 5,121,357 from foreign ores. Metals were produced from British ores as follows in 1913: fine copper, 421 tons; lead, 18,130 tons; white tin, 5288; zinc, 5823; silver, 138,046 ounces; gold, 153 ounces.

**FISHERIES.** Wet fish (exclusive of salmon and shell fish) landed on the coasts of the United Kingdom in 1913 amounted to 24,657,116 cwts., valued at £14,229,311; in 1914, 18,155,126 cwts., £11,228,829. The value of shell fish landed in 1913 was £463,642, and in 1914 £401,812. The cod catch in 1913 and 1914 respectively was valued at £2,300,119 and £2,321,617; herring, £4,572,295 and £2,115,899; haddock, £1,891,005 and £1,645,759; whiting, £390,980 and £397,462; sole, £474,127 and £395,386.

**COMMERCE.** Since the outbreak of the great war in August, 1914, certain goods belonging to the British and allied governments have been excluded from the returns of trade. The figures for 1915 here given are subject to revision. Total imports, imports reexported, and net imports (that is, imports for home consumption) have been valued as follows (exclusive of specie and bullion of foreign merchandise trans-shipped under bond, and of diamonds from the Union of South Africa):

	Total imports	Reexports	Net imports
1910	£875,257,024	£103,761,045	£574,495,979
1911	680,157,527	102,759,134	577,398,393
1912	744,640,681	111,737,691	632,902,940
1913	768,734,739	109,575,037	659,159,702
1914	696,635,113	95,474,166	601,160,947
1915	853,756,279	98,797,123	754,959,156

Total exports, reexports of foreign and colonial produce, and domestic exports (that is, exports of British produce) have been valued as follows (exclusive of specie and bullion and of foreign merchandise trans-shipped under bond):

	Total exports	Reexports	Dom. exp.
1910	£534,145,817	£103,761,045	£430,384,772
1911	556,878,432	102,759,134	454,119,298
1912	598,961,130	111,737,691	487,223,439
1913	634,820,326	109,575,037	525,245,289
1914	526,195,523	95,474,166	430,721,357
1915	483,444,459	98,797,123	384,647,336

In 1914 and 1915 respectively, imports of gold and silver specie and bullion amounted to £70,595,001 and £21,328,527; exports, £41,488,125 and £45,978,689.

Total imports of merchandise, domestic exports of merchandise, and reexports of foreign and colonial merchandise in 1914 and 1915 are shown by classes in the following table, in thousands of pounds sterling (figures for 1915 subject to revision):



	Total Imports		Dom. Exports		Re-exports	
	1914	1915	1914	1915	1914	1915
<b>I. Food, drink, and tobacco:</b>						
Grain and flour .....	79,636	112,863	3,095	3,785	2,578	4,154
Meat, including animals for food...	63,215	86,951	1,139	1,344	2,795	2,487
Other food and drink .....			19,006	16,076		
1. Non-dutiable .....	78,612	91,490			4,488	6,135
2. Dutiable .....	68,043	82,452			7,806	9,052
Tobacco .....	7,463	8,645	3,708	3,791	275	556
<b>Total .....</b>	<b>296,969</b>	<b>381,901</b>	<b>26,948</b>	<b>24,996</b>	<b>17,442</b>	<b>22,864</b>
<b>II. Raw materials and articles mainly un-manufactured:</b>						
Coal, coke, and manufactured fuel...	42	11	42,202	38,324	1	1
Iron ore, scrap iron, scrap steel....	5,487	7,564	298	197	11	2
Other metallic ores .....	9,534	11,605	110	27	414	301
Wood and timber .....	25,843	32,779	277	198	675	627
Raw cotton .....	55,851	64,673			7,859	9,604
Wool, including wags, etc. ....	34,247	44,149	4,469	3,846	13,709	6,977
Other textile materials .....	15,368	21,029	418	450	3,655	4,089
Oil seeds, nuts, oils, fats, and gums..	41,332	49,749	3,962	5,388	5,645	7,782
Hides and undressed skins .....	12,727	13,964	1,433	399	6,034	4,330
Materials for paper making .....	5,958	6,152	845	699	176	42
Miscellaneous .....	31,143	35,666	2,649	1,857	16,179	20,469
<b>Total .....</b>	<b>236,532</b>	<b>287,341</b>	<b>56,713</b>	<b>52,855</b>	<b>53,858</b>	<b>54,574</b>
<b>III. Articles wholly or mainly manufactured:</b>						
Iron and steel and manufactures thereof .....	10,877	10,839	41,668	40,422	256	340
Other metals and manufactures thereof .....	29,604	42,215	10,283	9,698	6,323	5,832
Cutlery, hardware, implements, and instruments .....	5,194	4,930	6,512	5,066	1,022	571
Electrical goods and apparatus *....	1,243	1,096	3,019	3,131	186	159
Machinery .....	6,713	8,848	31,363	19,192	1,050	728
Ships and boats (new) .....	32	157	6,933	1,637	1	1
Manufactures of wood and timber, including furniture .....	2,337	2,325	1,564	1,043	320	234
Yarns and textile fabrics:						
1. Cotton .....	9,373	7,556	103,266	85,926	1,797	1,276
2. Wool .....	7,648	1,725	31,500	32,838	1,152	337
3. Silk .....	13,393	14,633	1,866	1,698	2,126	2,060
4. Other materials .....	7,853	9,043	12,932	11,717	2,111	2,308
Apparel, including boots, shoes, and hats .....	4,253	2,956	14,532	11,509	605	259
Chemicals, drugs, dyes, and colors..	12,065	19,344	19,508	22,060	1,493	3,131
Leather and mfrs., excluding boots and shoes .....	13,478	17,044	4,635	3,796	1,330	1,510
Earthenware and glass .....	2,994	2,170	4,148	3,297	135	85
Paper and manufactures thereof....	6,791					
Railway carriages and trucks (not of iron), motor cars, cycles, carts, etc.	7,267	6,649	3,136	2,997	209	191
Miscellaneous .....	19,375	20,324	30,339	30,026	2,431	1,723
<b>Total .....</b>	<b>160,490</b>	<b>181,515</b>	<b>338,634</b>	<b>292,738</b>	<b>24,089</b>	<b>21,731</b>
<b>IV. Miscellaneous and unclassified † .....</b>	<b>2,644</b>	<b>2,999</b>	<b>8,426</b>	<b>14,508</b>	<b>85</b>	<b>58</b>
<b>Grand total .....</b>	<b>696,635</b>	<b>853,756</b>	<b>430,721</b>	<b>384,647</b>	<b>95,474</b>	<b>98,797</b>

\* Other than machinery and un-insulated wire. † Including parcel post goods not liable to duty.

Some of the more important articles of import not shown separately in the table were valued as follows in 1914 and 1915 respectively, in thousands of pounds sterling: wheat, 44,734 and 57,313; sugar (refined and unrefined), 32,118 and 31,833; beef, 23,366 and 30,367; butter, 24,014 and 27,036; bacon, 18,226 and 25,441; rubber, 15,844 and 20,322; tea, 14,221 and 19,751; maize, 11,761 and 18,897; fruits, 15,063 and 17,100; mutton, 11,594 and 14,130. For 1914 the domestic export of cotton piece goods is reported at 79,175 thousand pounds sterling, and for 1915 at 64,703; cotton yarn, 11,973 and 10,313; woolen tissues, 11,574 and 16,491; worsted tissues, 6204 and 6100; woolen and worsted yarn, 3793 and 2605; linen piece goods, 5480 and 4937; tinned plates and sheets, 5999 and 5688; galvanized sheets, 7227 and 4632; pig iron, 2924 and 3476; manures, 4886 and 4812; fish, 3758 and 1470.

The accompanying table shows the total imports of merchandise consigned from and the total exports of merchandise consigned to the principal countries, in thousands of pounds sterling:

	Imports		Exports	
	1914	1915	1914	1915
United States .....	138,575	238,006	64,039	55,545
Argentina .....	37,219	63,837	15,080	12,102
British India .....	43,348	62,341	63,336	46,619
Australia .....	36,853	45,281	37,089	31,312
Canada .....	31,485	41,001	20,500	16,546
France .....	37,774	31,470	35,052	32,307
New Zealand .....	22,904	30,417	10,419	10,134
Netherlands .....	24,311	23,440	20,672	30,509
Denmark .....	25,376	22,597	7,161	11,922
Egypt .....	17,096	21,736	7,934	6,530
Russia .....	28,093	21,429	21,492	25,038
Spain .....	15,915	20,915	3,714	3,936
Sweden .....	14,124	19,318	9,029	10,170
Straits Settlements....	13,321	16,537	4,627	3,323
Switzerland .....	10,064	15,258	3,571	4,097
Norway .....	7,702	13,092	7,177	9,371
Ceylon .....	3,035	12,259	2,966	2,060
Italy .....	8,699	11,268	13,913	17,618
Belgium .....	16,106	1,576	13,252	234
Germany .....	47,049	201	33,431	.....
<b>Total, including others .....</b>	<b>696,635</b>	<b>853,756</b>	<b>526,196</b>	<b>483,444</b>

SHIPPING. The net tonnage (exclusive of the coasting trade) entered and cleared at the ports,

with cargo and in ballast, was as follows in 1913 and 1914:

		Entered		Total
		Sail	Steam	
British	1913.....	376,059	46,226,861	46,602,920
	1914.....	306,505	40,050,730	40,357,235
Foreign	1913.....	1,501,646	34,044,003	35,545,649
	1914.....	1,221,705	29,527,522	30,769,227
Total	1913.....	1,887,705	80,270,864	82,148,569
	1914.....	1,528,210	69,598,252	71,126,462

		Cleared		Total
		Sail	Steam	
British	1913.....	388,206	46,308,447	46,646,653
	1914.....	234,265	38,068,906	38,303,171
Foreign	1913.....	1,455,796	34,558,563	36,014,859
	1914.....	1,088,752	29,576,158	30,659,905
Total	1913.....	1,794,002	80,867,010	82,661,012
	1914.....	1,318,017	67,645,059	68,963,076

The tonnage of vessels employed by the government in connection with the war is not included in 1914. Shipping by nationality is shown below, in thousands of tons net:

	Entered		Cleared	
	1913	1914	1913	1914
British	46,608	40,857	46,647	38,303
Norwegian	5,883	5,670	5,915	5,672
German	9,074	5,390	9,088	5,393
Dutch	3,169	3,521	3,217	3,507
Danish	3,150	3,169	3,171	3,187
Swedish	3,401	2,918	3,456	2,899
French	2,249	2,399	2,275	2,359
Spanish	1,763	1,738	1,803	1,755
Greek	999	1,240	1,090	1,240
Belgian	1,568	1,230	1,561	1,132
Italian	912	895	989	902
Russian	1,212	861	1,231	818
American	818	771	838	778
Austro-Hungarian	723	580	750	547
Japanese	415	341	413	341
Other	209	96	218	135
Total	82,149	71,126	82,661	68,963

At the end of 1913 and 1914 respectively, the number of vessels, with gross tonnage comprising the British merchant marine was as follows: sail, 8336 vessels, of 921,861 tons, and 8203 vessels, of 864,679 tons; steam, 12,602 vessels, of 18,683,039 tons, and 12,862 vessels, of 19,145,140 tons; total, 20,938 vessels, of 19,604,900 tons, and 21,065 vessels, of 20,009,819 tons. The total net tonnage is stated at 12,119,891 at the end of 1913 and 12,415,204 at the end of 1914. The net tonnage of steam vessels was increased in 1914, owing to the coming into full force, on January 1, 1914, of the provisions of the Merchant Shipping Act, 1907.

Number and net tonnage of vessels (other than war vessels) built in the United Kingdom in 1913 and 1914 respectively: sail, 338 vessels, of 30,382 tons, and 281, of 29,107 tons; steam, 909 vessels, of 1,170,107 tons, and 858, of 1,006,065 tons; total, 1247 vessels, of 1,200,489 tons, and 1139 vessels, of 1,035,172 tons. In 1913, 202 vessels, of 225,315 tons net, were built for foreign owners; in 1914, 129 vessels, of 196,564 tons. Vessels on the British register sold to foreign countries in 1913, numbered 433, of 488,240 tons net; in 1914, 327, of 398,929 tons net. These figures do not include war vessels.

COMMUNICATIONS. On Dec. 31, 1913, and Dec. 31, 1914, respectively, the length of railway line open to traffic in England and Wales was 16,401 and 16,414 miles; in Scotland, 3880 and 3876; in Ireland, 3410 and 3411; total for United Kingdom, 23,091 and 23,701. The total, reduced to single track, including sidings, was

55,405 miles at the end of 1913 and 55,663 miles at the end of 1914. On account of the war, later figures are not available. In consequence of special arrangements made in connection with the war, the financial returns for 1914 are incomplete; but, as reported for the end of that year, the total paid-up capital was £1,341,222,000, as compared with £1,334,011,000 in 1913. The average rate of dividend or interest was 3.52 per cent in 1914 and 3.62 in 1913; on account of nominal additions made to the capital, these rates are lower than they otherwise would be. For 1913 and 1914 respectively: gross receipts, £139,451,429 and £139,098,365; working expenses, £87,320,550 and £88,173,232; net receipts, £52,130,879 and £50,925,133; proportion of working expenses to gross receipts, 63 and 63.

The length of tramway and light railway line at the end of 1914 was 2703 miles; in 1913, 2662. Paid-up capital, £78,858,930; gross receipts, £15,787,877; working expenses, £10,150,556; net receipts, £5,628,321.

On March 31, 1913, and March 31, 1914, respectively, the length of telegraph and telephone lines was 75,042 and 81,000 miles; wire, 2,661,378 and 2,886,025 miles; offices, 14,129 and 14,237; instruments in use, 759,059 and 805,604 (of which, telephones 730,763 and 774,821). Post-offices in 1914, 24,447; in 1915, 24,509.

Under the government control of railways in the United Kingdom as practiced in 1915 and 1916 there was but little statistical or other information save such as was announced at the annual meetings of stockholders. In 1916 there was vastly more traffic than in 1915, and as regards freight there was available for comparison some figures of the earlier year. In commercial merchandise alone, and excluding all naval and military business the Great Central recorded an increase in value of traffic in 1915 of £81,000 over 1914. The Midland carried in 1915 3,749,844 tons of collected and delivered traffic as against 3,467,491 tons in 1914, and to London and beyond 5,667,443 tons of coal or an increase of 846,319 over the previous year. The London and Northwestern carried in 1915 the greatest volume of freight in its history, which was more than one million tons over 1913. The Great Western reported an abnormally large traffic, the Lancashire and Yorkshire record business, and the Furness line one of its best years, while the South-Eastern and Chatham, usually considered a passenger line, reported heavy freight traffic.

In 1915 the 44 principal railways contemplated in 1916 capital expenditures aggregating £4,437,607, the greater part of which was to go for electrification and rolling stock, the latter taking £960,207. Little new work was done on railway, bridges, or widening, etc. The new bridge across the Trent with a Scherzer bascule lifting span of 160 feet and weighing about 3000 tons, being the heaviest rolling lift span in Europe, was perhaps the most notable engineering work of the year. Only two new railways were under construction during the year. One, the Mansfield Railway Company, connected the Great Central main line at Kirkby, 12 miles north of Nottingham, with the Chesterfield and Lincoln branch, a distance of 11 miles, and was equipped for passenger as well as freight traffic. The other new enterprise was the Gowdall and Braithwell railway, from Gowdall on the Hull

and Barnsley main line to Braithwell, where it connects with the Midland and Great Central companies. This was built jointly by the Hull and Barnsley and the Great Central companies. Its southern terminal is at Dinnington colliery and the length of main line is 21 miles, or, with its various branches, over 25 miles. It was open for freight and coal and ore on May 1st, but the completion of the stations for passenger traffic was postponed until after the war. The progress of electrification (see ELECTRIC RAILWAYS) was slow, on account of the war, but wherever the lines were in operation wonderful service was being afforded, satisfactory both from a financial and technical standpoint. On the London, Brighton, and South Coast the equipment of two sections was proceeding slowly, while the London and Southwestern completed, during the year, the electrification of the suburban lines for which plans had been made, the last section being that between Elephant and Castle and Watford. The Lancashire and Yorkshire began electrical service early in the year between Manchester and Bury.

An important step taken during the year was the pooling of freight cars. This had been done by the Great Northern, Great Eastern, and Great Central companies, and on April 2nd the example was followed by the London and Northwestern, Great Western, Midland, North-Eastern, and Lancashire and Yorkshire, which adopted the principle of common use for all their open freight cars. The Scotch railways also formed a similar pool and on December 26th it was announced that with the new year all cars belonging to lines under government control would be used in common. Many economies were practiced during the year. Unnecessary and duplicating stations were closed, and dining cars were withdrawn on the London and Northwestern and Great Northern. On September 13th, the war bonus of the railway men was doubled, amounting to 10 shillings, the additional cost being assumed by the government. Late in the year (December 14th) an order in council was made in regard to railway traffic, giving to the Board of Trade very extreme powers. In Ireland a threatened strike of the enginemen on the Great Southern and Western Railway of Ireland was prevented on December 16th by the government taking control of all the Irish railways. In this way the regular war bonus could be paid to the employees by the government as in Great Britain, instead of coming as previously in the form of a few shillings from the stockholders.

**FINANCE.** The monetary unit is the pound sterling; its par value is \$4.86656. In years ended March 31st, revenue (actual receipts into the exchequer) and expenditure (chargeable against revenue) have been as follows, in thousands of pounds sterling:

	1905	1910	1913	1914	1915
Revenue ..	153,183	181,896	188,802	198,243	228,694
Expenditure	151,769	157,945	188,622	197,493	560,474

As officially stated for the fiscal years 1914 and 1915, receipts into the exchequer, under the principal heads thereof, are shown in the table below:

Revenue	1913-14	1914-15
Customs .....	£ 35,450,000	£ 38,862,000
Excise .....	89,590,000	42,313,000

Revenue	1913-14	1914-15
Estate, etc., duties .....	£ 27,859,000	£ 28,382,000
Stamps * .....	9,968,000	7,577,000
Land tax .....	700,000	680,000
House duty .....	2,000,000	1,980,000
Property and income tax ..	47,249,000	69,899,000
Land value duties .....	715,000	412,000
<b>Tax revenue .....</b>	<b>£163,029,000</b>	<b>£189,805,000</b>
Postal service .....	£ 21,190,000	£ 20,400,000
Telegraph service .....	3,080,000	3,000,000
Telephone service .....	6,530,000	6,250,000
Crown lands (net) .....	530,000	545,000
Receipts from Suez Canal shares and sundry loans ..	1,579,972	1,276,882
Fee and patent stamps ..	1,078,000	961,000
Receipts by civil departments, etc. ....	1,225,925	4,956,448
<b>Total revenue .....</b>	<b>£198,242,897</b>	<b>£226,694,080</b>

\* Exclusive of fee and patent stamps.

Expenditure chargeable against revenue is officially stated as follows, for the fiscal years 1914 and 1915:

Expenditure	1913-14	1914-15
<b>Consolidated fund services:</b>		
National debt services .....	£ 24,500,000	£ 22,668,896
Road improvement fund ..	1,394,951	1,528,365
Payments to local taxation accounts, etc. ....	9,734,128	9,529,184
Civil list .....	470,000	470,000
Other .....	1,169,890	1,223,414
<b>Total .....</b>	<b>£ 37,322,969</b>	<b>£ 35,419,809</b>
<b>Supply services:</b>		
Army .....	£ 28,346,000	£ 28,885,724
Navy .....	48,833,000	51,550,000
Civil services * .....	53,901,000	56,956,000
Customs and excise .....	2,431,000	2,479,000
Inland revenue .....	2,052,000	2,123,000
Post office services .....	24,607,000	26,060,000
<b>Total .....</b>	<b>£160,170,000</b>	<b>£168,053,724</b>
Votes of credit—naval and military operations, etc. ....		357,000,000
<b>Total expenditure ..</b>	<b>£197,492,969</b>	<b>£560,473,533</b>

\* Including expenditure on education, science, and art (£19,450,000 in 1913-14 and £20,284,000 in 1914-15) and old-age pensions, labor exchanges, insurance, etc. (£19,666,000 and £20,799,000).

In addition to expenditure chargeable against revenue, there was capital expenditure amounting to £4,220,749 in 1913-14 and £4,293,000 in 1914-15.

The following table shows receipts into the exchequer as reported for the fiscal year 1916 and the estimates for the fiscal year 1917:

Revenue	1915-16	1916-17
Customs .....	£ 59,608,000	£ 71,000,000
Excise .....	61,210,000	62,000,000
Estate, etc., duties .....	31,035,000	30,000,000
Stamps * .....	6,784,000	7,000,000
Land tax .....	660,000	660,000
House duty .....	1,990,000	1,990,000
Property and income tax ..	128,320,000	195,000,000
Excess profits tax .....	140,000	86,000,000
Land value duties .....	863,000	475,000
<b>Tax revenue .....</b>	<b>£290,088,000</b>	<b>£454,125,000</b>
Postal service .....	£ 24,100,000	£ 26,000,000
Telegraph service .....	3,850,000	3,250,000
Telephone service .....	6,450,000	6,850,000
Crown lands (net) .....	550,000	550,000
Receipts from Suez Canal shares and sundry loans ..	2,432,000	5,000,000
Miscellaneous † .....	9,797,000	3,500,000
<b>Total revenue .....</b>	<b>£336,767,000</b>	<b>£499,275,000</b>

\* Exclusive of fee and patent stamps. † Including fee and patent stamps.

Below are shown the expenditure chargeable against revenue as reported for the fiscal year 1916 and the estimates for the fiscal year 1917:

Expenditure	1916-16	1916-17
<b>Consolidated fund services:</b>		
National debt services..£	60,249,000	£ 127,254,000
Road improvement fund	694,000	.....
Payments to local taxation accounts, etc...	9,757,000	9,500,000
Other .....	2,788,000	1,700,000
<b>Total .....</b> £	<b>73,488,000</b>	<b>£ 138,454,000</b>
<b>Supply services:</b>		
Army * .....	15,000	£ 15,000
Navy * .....	7,000	17,000
Ministry of munitions * ..	2,000	1,000
Civil services † .....	54,718,000	55,515,000
Customs, excise, and inland revenue .....	4,608,000	4,841,000
Post office services .....	26,678,000	26,537,000
Votes of credit—naval and military operations, etc. ....	1,399,652,000	1,600,000,000
<b>Total expenditure..</b> £1,559,158,000		<b>£1,825,380,000</b>

\* The figures represent token votes, the full expenditure being included in the last item, votes of credit. † Including expenditure on education, science, and art (estimated at £19,584,000 for 1916-17), old-age pensions (£12,654,000), and labor exchanges and insurance (£7,693,000).

At the end of the fiscal year 1916, that is, on March 31st, the reported gross liabilities of the British government were about £2,140,000,000, of which £368,000,000 represented advances to the Allies and British dominions. The gross liabilities March 31, 1915, amounted to £1,165,801,702, consisting of the following: funded debt, £583,290,097; estimated capital liability in respect of terminable annuities, £28,040,721; unfunded debt, £497,486,258; other capital liabilities, £56,984,626. The funded and unfunded debts and the capital liability in respect of annuities constitute the so-called "dead-weight" debt, which, on March 31, 1915, amounted to £1,108,817,076, as compared with £651,270,091 on March 31, 1914, £713,245,408 in 1910 and £755,072,109 in 1905. See BANKS AND BANKING; FINANCIAL REVIEW; PRICES, and below under *History*.

ARMY. See MILITARY PROGRESS.

NAVY. See NAVAL PROGRESS.

GOVERNMENT. The executive authority is vested in the King, acting through a ministry appointed by him and responsible to the House of Commons. The legislative power is exercised by the Parliament, which consists of the House of Lords and the House of Commons. An act to establish a separate parliament in Ireland was passed in 1914, but its operation was postponed until the termination of the great war. The peers entitled to sit in the House of Lords number 654, including the lords spiritual and temporal and three princes of the blood royal. Members of the House of Commons are elected by direct vote for the duration of a parliament, the maximum duration, in the absence of special legislation extending it, being five years; their number is 670, England being represented by 465, Wales by 30, Scotland by 72, and Ireland by 103.

The King in 1916 was George V, born June 3, 1865. He succeeded to the throne May 6, 1910, as the second but only surviving son of Edward VII. He married July 6, 1893, Princess Victoria Mary, only daughter of the late

Duke of Teck. The heir-apparent is Edward Albert, Prince of Wales, born Dec. 14, 1895.

The Liberal ministry of Herbert Henry Asquith came into power April 8, 1908; it was succeeded May 25, 1915, by a coalition ministry, in which Mr. Asquith retained the premiership. On Dec. 5, 1916, Mr. Asquith resigned, and two days later David Lloyd George (q.v.), who had been secretary of state for war since the death of Earl Kitchener (q.v.), accepted the post of prime minister. The members of the new ministry who constitute the cabinet were as follows: Prime Minister and First Lord of the Treasury, David Lloyd George (Liberal); Lord High Chancellor, Sir Robert Bannatyne Finlay (Unionist); Lord President of the Council, Earl Curzon (U.); First Lord of the Admiralty, Sir Edward Carson (U.); Secretary of State for Home Affairs, Sir George Cave (U.); Secretary of State for Foreign Affairs, Arthur J. Balfour (U.); Secretary of State for the Colonies, Walter Hume Long (U.); Secretary of State for India, Austen Chamberlain (U.); Secretary of State for War, Earl of Derby (U.); Chancellor of the Exchequer, Andrew Bonar Law (U.); Secretary for Scotland, Robert Munro (L.); Chief Secretary to the Lord Lieutenant of Ireland, Henry E. Duke (U.); Postmaster-General, Albert Illingworth (L.); President of the Board of Trade, Sir Albert Stanley; President of the Local Government Board, Baron Rhondda (L.); President of the Board of Education, Herbert A. L. Fisher (U.); Chancellor of the Duchy of Lancaster, Sir Frederick Cawley (L.); First Commissioner of Works, Sir Alfred M. Mond (L.); Attorney-General, Sir Frederick E. Smith (U.); Minister of Labor, John Hodge (Labor); Minister of Munitions, Christopher Addison (L.); Minister of Blockade, Lord Robert Cecil (U.); Minister of Pensions, George N. Barnes (Lab.); Food Controller, Baron Devonport (L.); without portfolio, Arthur Henderson (Lab.), Lord Milner (U.); Lord of Privy Seal, Earl of Crawford (U.).

#### HISTORY

THE COST OF THE WAR AND THE BUDGET. Toward the close of 1915 Mr. Asquith, on asking for a vote of credit, estimated that the liability of the war would amount to about £5,000,000 a day. At the close of the fiscal year March 31, 1916, it was found that the average daily cost had been well below this limit. The figures available at that time showed the conditions to be as follows: The debt on March 31, 1914, had been \$3,256,350,000. During the war period, including the vote of credit passed on Feb. 21, 1916, for \$2,100,000,000, the total credits were \$10,410,000,000, which the Premier characterized as not only beyond precedent, but actually beyond the imagination of financiers of Great Britain, or any other country. The government congratulated itself on the excellent state of British credit, remarking the extraordinary fact that after 18 months of war, Great Britain should be almost the only open gold country in the world, and that British paper could be exchanged for gold at the bank.

Before asking for a new vote of credit Mr. Asquith declared that the financial burden could be met only by taxation and by severe economy. Taxation by itself would be inad-

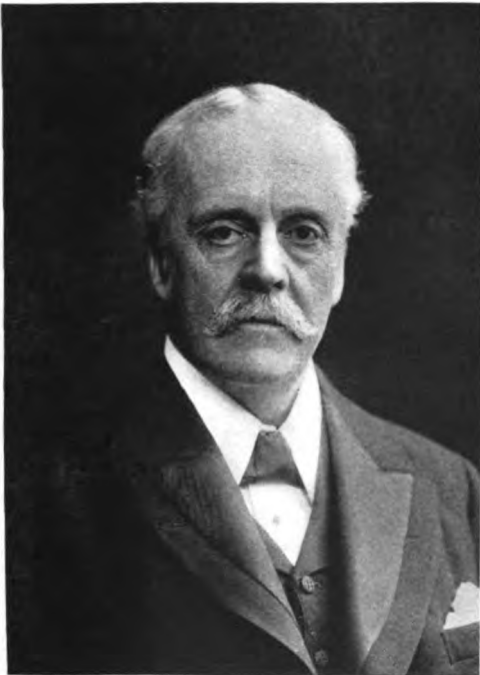


Courtesy Review of Reviews

**HERBERT HENRY ASQUITH**  
Prime Minister  
Resigned December 5, 1916



**LORD ROBERT CECIL**  
Minister of Blockade



**ARTHUR J. BALFOUR**  
Secretary of State for Foreign Affairs



Photo by Paul Thompson, N. Y.

**DAVID LLOYD GEORGE**  
Prime Minister and First Lord of the Treasury  
December 7, 1916

**GREAT BRITAIN—FOUR CABINET MINISTERS**



quate. It was necessary to maintain credit and to keep up production and the export trade. It was also necessary to cut down unsparsingly on needless imports and consumption of luxuries, and this should be done in private as well as in public affairs. Mr. McKenna, Chancellor of the Exchequer, introduced in the House of Commons early in April the fourth war budget. The main points in this budget were that out of the estimated expenditure of £1,825,000,000 pounds, the Chancellor proposed to obtain nearly £500,000,000 from revenue. The estimated expenditure was no higher than had been foreseen since the previous September, and it represented practically the £5,000,000 a day which the Premier had previously mentioned. The new taxes included taxes on admission tickets to theatres, moving pictures, football matches, and horse races, and on railway tickets, house matches, table waters, cider and perry. There was an increase in the income tax, motor tax, motorcycle tax, and taxes on sugar, cocoa, coffee, chicory, and excess profits.

In August the Chancellor presented an account of the financial position of Great Britain, after two years of war. The showing on the whole was favorable. He estimated the indebtedness at £3,440,000,000; advances to Allies and dominions, £800,000,000; net indebtedness, £2,640,000,000; national income, £2,500,000,000 or £2,600,000,000. The national wealth he placed at £15,000,000,000. He held that the country had practically financed itself out of the yearly bills and that if he had not asked for a large loan, it was because such a loan had been unnecessary. The country was able to borrow abroad at a lower rate than any of the other belligerent powers. He said that the national income and indebtedness would come out about even at the end of March, 1917. The national indebtedness would at that time, he thought, be less than one-sixth of the total national wealth, and interest on the debt would be paid out of existing taxation.

On December 14th Mr. A. Bonar Law who had succeeded Mr. McKenna as chancellor of the exchequer moved a new vote of credit (the fourteenth since the beginning of the war) for £400,000,000, which was promptly granted. This brought the total since the outbreak of the war to £3,532,000,000. This statement showed the daily expenditure had risen to £6,710,000.

**MEASURES OF ECONOMY.** The committee to consider means of retrenching the cost of government services reported in February. The report did not make any radical recommendations. The reason why reduction beyond a certain scale was regarded as impossible, was because the great increase of the civil expenditure in recent years had arisen from a policy definitely determined by Parliament, namely, the policy that involved social legislation, such as old-age pensions, labor exchanges, national insurance, etc. There could be no wholesale reduction without restricting state activities in this domain. If this were to be done Parliament would have to act in the matter very radically. A number of temporary retrenchments were suggested for the most part on the principle that any work in the public departments that was not of vital importance must be deferred. The movement for husbanding the resources of the nation in all particulars gath-

ered force as the year went on. A memorial signed by many prominent persons urged the cabinet to take measures in view of the serious needs for raising money and in forcing economy in all possible ways. There was especially emphasized the need of encouraging thrift among all classes. The War Savings Committee of the Government began on February 17th, to issue a series of appeals with the latter end in view. It urged the people to check certain forms of expenditure as wasteful, and as drawing labor from useful fields. It mentioned the use of automobiles and motorcycles for pleasure. Later, on February 23rd, it urged a general reduction in the scale of living, in large private establishments, and the cutting down of domestic labor. A national savings campaign was begun on March 1st, when a meeting was held in London. Lord Kitchener said, that "Either the population must go short of many things or the army must go short of munitions and other indispensable things." On December 5th the Board of Trade issued an ordinance prohibiting after December 18th any hotel, restaurant, or public place from serving meals of more than three courses between 6 P. M. and 9.30 P. M. or of more than two courses at any other time.

**ECONOMIC DIFFICULTIES.** The shortage of labor in 1915, together with the increase in wages and the substitution of unskilled for skilled workmen and workingwomen, had led on December 9th to a coalition of workmen numbering 2,000,000 in the Miners' Federation, the National Union of Railwaymen, and the National Transport Workers' Union. In June, 1916, a trade union congress pointing to the fact that prices had risen 59 per cent urged the government to regulate prices and to assume ownership of all merchant shipping. It also demanded a 50 per cent increase of all old-age pensions and an increase of the taxes on large incomes. Another difficulty was one that Earl Curzon pointed out in May, namely, the extraordinary decrease in mercantile tonnage, owing to the requisitioning of the vessels for war purposes. He placed this depletion at 43 per cent and estimated that for ordinary commerce only about the same amount was left. This required the reduction of the volume of trade, and a series of proclamations was published beginning on February 15th, prohibiting the importation of large classes of bulky commodities and commodities that were not indispensable. The effect of this measure was to reduce within a short time the tonnage of the imports by more than 2,000,000.

On October 10th Mr. Runciman announced that in view of the difficulty of getting supplies of wheat and the danger of leaving it exclusively to private enterprises, the government had created a Royal Commission with power to secure an adequate and regular supply. This commission would control the importation of wheat into the United Kingdom. The measure was received with approval, and the commission was appointed. The terms of its duties were as follows: To inquire into the supply of wheat and flour in the United Kingdom; to purchase, sell, and control the delivery of wheat and flour on behalf of His Majesty's government; and generally to take such steps as seem desirable for maintaining the supply. See **STRIKES; WOMEN IN INDUSTRY.**

**TRADE AFTER THE WAR.** The discussion of the measures to be taken to prevent commercial aggression and to provide for the restoration of the trade of the Allied powers after the war, assumed more definite form early in the year. An important debate was held in Parliament on January 10th, when a motion was introduced, calling upon the government to consult with the dominions with a view to increasing the power of the Allies in the prosecution of the war by means of a complete economic coöperation throughout the Empire with the purposes of the Allied governments. It was argued that before and during the war Germany's economic and military policy had been one and the same; that Germany had regarded trade as a weapon of offense; that she was prepared to use it in the same way at the end of the war; and that it was the business of the Allies to prevent her from resuming her economic offensive. Whereas with Great Britain, trade had always been a matter of individual enterprise, Germany had controlled and systematized her entire commerce, with an almost military discipline. Henceforth from the point of view of the Allies, trade could not be looked upon as a friendly rivalry without regard to nationality. Therefore it was proposed that trade measures with the dominions and between the Allies should be taken in order to convince Germany and the world that any aggressive commercial scheme on Germany's part would be a failure. The debate did not bring out any very definite proposals, but it paved the way to wide discussion of the matter in the press. At the meeting of the British Association of Chambers of Commerce in London on February 29th, more than 1000 delegates from all the great commercial associations of the country were present. The main point discussed was the question of change in the present tariff system, on the ground that it had by its practically free admission of foreign imports been one of the chief means of building up German industry. The Chancellor of the Exchequer, Mr. McKenna, was present, and in an address to the executive committee said that the government was not committed to its old economic policies, in so far as change was needed to adapt them to war conditions. Among the more important resolutions adopted were, first, a declaration that the experience of war had shown that safety depends on Great Britain's possessing the power to produce what she needs from her own soil and factories, rather than the possession of values which required exportation and exchange; second, a resolution providing first for preferential trading relations between all British countries, second, for reciprocal relations between the British Empire and Allied countries, third, for favorable treatment of neutral countries, fourth, for restriction of all trade relations with enemy countries, so as to make it impossible to return to the conditions that prevailed before the war. A tariff resolution was also passed urging the government to take steps to foster and safeguard British industries, the words "foster and safeguard" being substituted for the word "protect," which had been at first proposed. In addition to these there were resolutions providing for consulting the dominions and colonies in regard to war problems, and especially

in regard to reciprocity agreements, and for future trade relations with the Central Powers, and finally, a resolution for the appointment at once of a minister of commerce and industry of cabinet rank to be chosen from the business element.

**THE PARIS CONFERENCE.** The much discussed Paris conference took place from June 14th to June 17th inclusive, and its results were received with great satisfaction on all sides in Great Britain. There the public opinion seemed to regard as most important the resolution that Germany should be denied the most favored nation treatment, after the war, and the recommendations for the maintenance of essential industries in the Allied countries in order to secure economic independence. Other measures that attracted much attention were the plan for discrimination against Germany after the war, and the need of immediate economic organization of the British Empire along the lines favored by Mr. William M. Hughes, whose speeches on the subject had attracted much attention not only in England but throughout the entire Empire. See *FRANCE, History; HUGHES, WILLIAM M.; TARIFF; WAR OF THE NATIONS.*

**TRADING WITH THE ENEMY ACT.** This measure as amended passed the House of Commons on January 25th, and received the royal assent on January 27th. It was designed for the destruction of German influence over British trade and its provisions were drastic. The Board of Trade was empowered to prohibit persons of hostile origin or associations from carrying on their business during the war, or actually to compel them to wind up their business. It forbade British firms and individuals to trade with any firm or individual in a neutral country who had German associations. Another aim of the bill was to force German shareholders out of British companies, and to this end any interest owned by such shareholders in these companies could be disposed of by the Public Trustee at a reasonable price. The Public Trustee also might take possession of any enemy patents which had not been completed at the outbreak of the war. This Trading with the Enemy Act went further than its predecessors and it looked even to continuance beyond the close of the war if a trade war should develop at that time. While the previous acts were confined to the duration of the war, this one was not to expire until repealed by order in council.

The act of December 23rd caused much concern to the United States government and diplomatic correspondence followed. This was published on April 13th. See the article **UNITED STATES.**

**CONSCRIPTION.** On January 4th, Lord Derby submitted a report on the effect of the new military measures. According to this the number of unstarred men, who had not offered themselves, was 651,160, but of these many were not liable on account of medical unfitness, or other cause. It will be remembered that a pledge had been made the previous year to the married men that the unfair operation of the recruiting system would be remedied. To keep this pledge the Military Service bill was introduced, calling on unmarried men, and childless widowers between the ages of 18 and 45, who had not attested under the Derby plan, to at-



test at once. They were to have all the rights of exemption and appeal accorded by that plan; the law was to last only through the present war, and Ireland was excluded. The bill encountered vigorous opposition from a minority, consisting of Nationalists, Liberals, and members of the Labor party, but this opposition was reduced as a result of discussion and explanations in Parliament, and on the third reading it was carried by 383 against 36, that is to say, a majority of 347. The government had declared that unless the bill were voted it would be seriously hindered in the prosecution of the war. To the objection that it threatened to introduce the principle of industrial conscription, the government declared that its framers had had no such intention and that it would create machinery and safeguards to prevent such a result.

The attitude of the workmen in general toward the Military Compulsion Bill seemed on the surface contradictory, that is to say, at the British Labor Party Conference at Bristol on January 27th, by a vote representing 1,716,000 against 360,000 conscription was condemned in principle, and the Military Compulsion Bill was opposed, but at the same time a motion to agitate for its repeal was defeated by a vote representing 649,000 against 614,000. This was probably due to the feeling that while the workmen wished to show themselves opposed on principle to militarism they also wished to make it clear that they did not intend to hamper the government in carrying on the war. The Labor Conference in its final session sanctioned by an overwhelming majority the participation of Labor members of Parliament in the Coalition cabinet.

The bill had excused from service the following classes: Conscientious objectors, men who were the sole support of dependents, men engaged in industries essential to the prosecution of the war, and the clergy of all denominations. On February 14th, a proclamation was issued calling to the colors all single men of military age, who were not exempt. On February 21st, recruits of Class 1, that is to say all bachelors who on Aug. 15, 1915, had reached the age of 18, were required to report for duty before March 31st. On March 16th the married men who had attested held a meeting in London to protest against the laxity shown by the government to single men. They said that there were still 2,000,000 men available and that the married men would refuse to serve unless the single men were called to the colors before them. The last day for voluntary enlistment of single men had been March 1st, but although considerable numbers had enrolled, the results were disappointing. This was attributed to the readiness with which single men, especially those engaged in work required by the government, could secure exemption.

The failure to meet the military needs led in March to renewed agitation for universal service, and on May 3rd a radical conscription measure was introduced. Its provisions as explained by the Prime Minister were as follows: All males between the ages of 18 and 41 either married or single, were subject to compulsory enlistment, and every male on reaching the age of 18 was liable. The service of the men now in the army whose time would otherwise ex-

pire was extended for the period of the war. All time-expired men were to be recalled if they were under 41 at the passing of the bill. A special reserve was formed for men who might be employed either in civil work or in military service as was required. The bill passed its third reading on May 23rd by a vote of 250 to 35, and was signed by the King on the 25th. It authorized the government to call to the colors all males liable to service. It provided for an industrial army of reserve to which the government could assign as many men as were required. All males between 18 and 41 years of age, married or single, were liable to service. The attempt to amend it by a clause extending conscription to Ireland, was defeated without division on May 9th. Mr. Lloyd George (q.v.) in reply to a motion to reject the principle, declared emphatically that he would prefer to be ruled out of his party, and to abandon his political career rather than to refuse to the military authorities the men of whom they had need, and he concluded "Until Russia has completed her equipment so as to employ her immense reserves of men it is essential that France and Great Britain put every available man in the field."

As to the increase of the army during the war Mr. Asquith, in the course of an address in the spring, pointed out that in time of peace at the beginning of the war the total forces both in the army and navy were about 600,000. At that time, that is to say, May, there were 5,000,000. The number of divisions in the army had been increased from 26 at the beginning of the war to 83. Exact figures for British enlistment since the beginning of the war were, however, for the first time made public by the King on May 25th. They were 5,041,000 men.

The trouble with the conscientious objectors became more acute in the spring. On April 12th it was reported that two had been tried by court-martial and sentenced to two years' imprisonment at hard labor. In May it was reported that many whose objections to military service had been overruled by the authorities were court-martialed for disobedience of military orders, and on June 24th the government announced in the House of Commons that 34 conscientious objectors at the front who had refused to perform certain military duties had been sentenced to death, but that the sentence had been commuted to penal servitude.

THE DOMINIONS AND THE WAR. From the first there had been marked evidence of loyalty to the Empire in its time of danger and as the months passed the aid rendered by the Dominions increased. In the middle of the year 1916 the number of men raised for Great Britain by the self-governing dominions and India was estimated at almost 1,000,000. Of these Canada had contributed the largest share, the number of her troops at the front being estimated toward the end of June at three full divisions, the number of recruits at 345,000, the number sent overseas at 225,000. Australia in June had sent about 20,900 and at the same time New Zealand had sent about 49,000. South Africa, besides supplying forces for the conquest of German East Africa and German Southwest Africa, had sent a body of troops to France and from India there had come about 300,000. Besides this evidence of imperial solidarity there were signs of a movement for a

more compact imperial organization. One of the leading advocates of closer imperial federation was Mr. William M. Hughes (q.v.), Premier of Australia, who conferred with the New Zealand and Canadian governments, visited England and participated in the discussion of the cabinet and the War Council. He also was a representative at the Allied Economic Conference in Paris. He made speeches on the subject of imperial solidarity which attracted wide attention. See also CHILD LABOR; CITY PLANNING; COÖPERATION.

**MINISTRY OF BLOCKADE.** On March 2nd, Lord Newton was appointed to take charge of certain departments of the Foreign Office hitherto directed by Lord Robert Cecil, who in turn was appointed Minister of Blockade. This new office of blockade minister was announced in the House of Lords on February 22nd, by the Marquis of Lansdowne, the government having decided to place under a single minister the charge of matters connected with the blockade of Germany. He was to have charge of the administration of the orders in council, regulating the blockade, and was to be responsible also for the policy and practice of the government as to trade passing to and from neutral countries. Lord Cecil retained his office of under secretary of state on becoming minister of blockade.

**DEFENSE OF REALM ACT.** By this statute very extensive power had been conferred upon the sovereign under the general head of "regulations for securing the public safety and the defense of the realm," so long as the war continued. Under this act some of the historic guarantees of individual liberty were sacrificed without complaint. Although in the past the habeas corpus acts had been suspended on several occasions no measure ever went so far in bestowing discretionary powers upon the Crown. In January a test case was brought before the Divisional Court involving the authority under recent legislation of the King in council to arrest and keep in prison one of his subjects without trial. The court held that by virtue of the regulation made under the Defense of the Realm Act the King had this authority. The decision of the Divisional Court was later upheld by the Court of Appeal. Another regulation under the same general statute empowered the Secretary of State at his discretion to intern persons of "hostile origin or associations."

**AÉRIAL SERVICE.** The resignation of the Earl of Derby, chairman, and Lord Montague, vice-chairman of the joint National and Military Board in charge of the aerial service, was announced on April 11th. Their withdrawal was attributed to dissatisfaction with the present organization, both desiring that that department be centralized and coördinated. There was considerable dissatisfaction on all sides with the air service, especially with measures taken for the protection of London. On May 17th, during a debate in the House of Commons the government announced that it had decided to create an Aerial Board which was to advise the Admiralty and the War Office in regard to the service, and that the president was to be Earl Curzon. The spokesman for the government denied the superiority attributed to the German air service, saying that the English service had won a great majority of the combats in

the air, and was really in many respects superior; moreover, that the British service now possessed two types of aeroplanes which were faster than the Germans', and that there were two other types which were quite as fast as the German Fokker. See AÉRONAUTICS.

**SINN FEIN MOVEMENT.** The Sinn Fein organization which brought about the most serious and the most ably directed rebellion in Irish history since 1798, was founded in 1905, for purposes not unlike those of the Gaelic League which preceded it by a few years. The words Sinn Fein mean "Ourselves Alone," and the central idea of the society was that the Irish people should recover and assert its nationality in every possible way, in language, in dress, in the development of Irish resources and industries, and in progress along national lines. Unlike the Gaelic League, however, whose programme was exclusively educational, its scope was political from the first. It opposed Irish representation in the British Parliament and attacked the Nationalist party, whose members in Parliament it accused of being tools of the Liberal party and indifferent to the Irish cause. It demanded that they withdraw from Parliament and devote themselves to their own country. As another evidence of distinct nationality, the Sinn Fein urged the creation of an independent Irish consular service. With Irish consuls in all the large cities of the world, attention would be drawn at once to the national aspirations of Ireland. Friends for the cause would be won and in the long run such a service would open opportunities for Irish trade abroad. It had no patience with the Home Rule plan. It held that Ireland should not wait for Home Rule as a gift from the British Parliament, but should start measures of independence on her own account. Self-reliance was the Sinn Fein's motto. It was inspired at first by Mr. Arthur Griffith, a journalist of marked force and ability who expounded its doctrines in a weekly newspaper and drew to him a small body of very zealous followers, some of them intellectuals, others men impatient of parliamentary methods, and still others men fired with the traditional hatred of the English. The Sinn Fein made little headway. The agricultural population were fairly well satisfied with the land situation and wanted to be left in peace. The Nationalist party and the Nationalist press ridiculed it. Politically, it was regarded as of little importance in general, but the Unionist press supported it mildly as a weapon against the Nationalists. The Sinn Fein took sides with the Larkinites in 1911 and 1912, but gained little from the union and after the introduction of the Home Rule bill there seemed for a time to be little public interest in the movement. The formation of the Irish Volunteers toward the end of 1913 improved its chances. It associated itself with the Irish Volunteer movement in which it became the controlling element.

**OUTBREAK OF THE IRISH REBELLION.** The first act of the Sinn Fein rebels was the seizure of Stephen's Green, the post office and other buildings in the centre of Dublin on Easter Monday, April 24th. At the same time a proclamation was issued asserting the right of Ireland to national existence and announcing the foundation of a new republic, based on adult suffrage and complete civic and religious lib-

erty, equality, and fraternity. The flag of the new state was green and gold. A provisional government was set up with headquarters in Liberty Hall under Padraic Pearse (q.v.), president, James Connolly (q.v.), commandant in Dublin, Messrs. Clarke, MacDonagh, Ceannt, Plunkett, and MacDiarmad. After a sharp struggle in which many were killed and wounded, including a considerable number of civilians, the British forces, under Major-Gen. Sir John Maxwell, who had formerly commanded in Egypt, succeeded in overpowering the rebels, not, however, until they brought artillery and machine guns into play and mowed down great numbers of them. On April 29th, the provisional president, Pearse, ordered unconditional surrender in order to prevent useless slaughter, and the rebels laid down their arms on April 30th. In Dublin 300 had been killed and 1800 made prisoners. The British troops lost 521 men. The attempt of Sir Roger Casement (q.v.) was made on April 21st. He was trying to land from a German submarine off the Irish coast when he was captured. At the same time a German ship carrying munitions accompanied the submarine and was sunk and the crew made prisoners. Sir Roger was imprisoned in the Tower and afterwards tried by the High Court of Justice, which on June 29th found him guilty of treason and sentenced to be hanged. The punishment inflicted by the government was extremely severe. In May, Pearse, Clarke, MacDonagh, Plunkett, and 11 others were tried in secret court-martial and shot. The Countess Markiewicz, who had been one of the most active of the combatants, was sentenced to death, but this was commuted to penal servitude for life. A large number were condemned to long terms in prison. Several hundred were taken to England and the number of those arrested was placed at 3000. From the first the Irish administration was severely blamed for its weakness and lack of foresight. Mr. Augustine Birrell, Chief Secretary, Sir Matthew Nathan, Under Secretary, and Baron Wimborne, Lord Lieutenant, resigned early in May and the acceptance of their resignations was announced on June 22nd.

**THE ROYAL COMMISSION.** The causes of the revolution were investigated by a Royal Commission under the chairmanship of Baron Hardinge, which began its session on May 10th. Its report was published on July 3rd. It brought out that there were only 2255 available British troops in Ireland on April 24th. It condemned the course of Mr. Birrell and impliedly the entire cabinet for weakness in allowing the Ulster and Nationalist Volunteers two years before to threaten a civil war and make actual preparations for it and for paying no heed to serious warnings given him as early as February.

**THE HOME RULE COMPROMISE.** The Nationalists, headed by Mr. Redmond, remained loyal and condemned the insurrection, but the severity of the government roused at first discontent and later extreme indignation. The criticism became so severe that measures of adjustment were necessary and Mr. Lloyd George was delegated by the cabinet to arrange a compromise with the Irish leaders. The main point in his programme was that the Irish Home Rule Act of 1914, known as the Government of Ireland Act, should go into effect at once after

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certain serious modifications, of which the most important was that Ulster should be temporarily excluded; a parliament was to be set up in Dublin for the other provinces with a Lower House consisting of the Irish members of the British House of Commons with the exception of the 25 from Ulster, and a senate to be chosen by proportional representation; the 103 Irish members in the British House of Commons were to be retained. This settlement was to be regarded as temporary, and on the conclusion of peace a revision of it was to be considered at an imperial conference which would reconstitute the entire machinery of the imperial government. The Nationalists, under the influence of John Redmond, unwillingly accepted the compromise. The Sinn Feiners and the irreconcilable Unionists opposed it. It was doubtful whether the Unionist members of the cabinet could be prevailed upon to accept it and it was feared that the coalition would be broken up. In fact, the Unionist minister, Earl Selborne, president of the Board of Agriculture and Fisheries, resigned on June 25th, saying that he could not approve the putting into effect of any Home Rule plan during the war, though he was willing that it should be discussed. Mr. Asquith, however, with his usual adroitness in effecting compromises, won over Unionist sentiment by concessions, and on July 10th was able to declare that the cabinet would support Lloyd George's measure. The delay in putting this measure into effect caused much irritation among the Nationalists, who were further exasperated by Lord Lansdowne's declaration of July 11th that the success of the compromise required the retention of General Maxwell and 40,000 troops in Ireland, and by Mr. Asquith's disclosure on July 24th of the points in which he had yielded to the Unionists' demands. He said that Ulster's exclusion should be permanent and that the number of Irish members at Westminster must be reduced even before the final settlement after the war. The demand of the Nationalists was expressed by Mr. Dillon in a speech early in August in which he said, Either trust the people or govern them with a strong hand. He declared that the system of military government of General Maxwell had done more than the Sinn Fein toward stirring up the country. Mr. Asquith declared that martial law had not been enforced, although it had been proclaimed as a safeguard. He expressed the hope that the new secretary, Mr. Duke, a Unionist who had been appointed as Mr. Birrell's successor, would find it possible to discard it. He characterized General Maxwell's administration as tactful and merciful. Mr. Redmond criticised the government for the appointment of a Unionist. He appealed to Parliament and the people to bear in mind Ireland's part in the war, and the fact that there were some 150,000 Irishmen fighting in France. The critics of the government characterized the Prime Minister's course as halting and inefficient.

**CHANGE OF MINISTRY; REORGANIZATION.** At the end of November rumors of impending changes in the ministry were circulated, and during the first week in December it became definitely known that there were serious dissensions in the government between the Premier and Mr. Lloyd George. After conferences with the King and with other members of the

cabinet Mr. Asquith announced his resignation. After the refusal of Mr. Bonar Law to become prime minister, Mr. Lloyd George was invited to form a ministry and his acceptance was announced on December 6th. The composition of the new cabinet and the reorganization of the War Council were made public on December 10th. The latter was to be made up of Mr. Lloyd George, Prime Minister, Lord Milner, and Mr. Arthur Henderson, both without portfolios, that they might give all their time to the Council, and Earl Curzon and Mr. Bonar Law; the two last-named being government leaders in the Upper and Lower House respectively were not expected to be regular in their attendance. See above paragraph on *Government*.

This change was regarded as a radical departure, involving centralization of both the civil and the military administrations. The powers vested in Mr. Lloyd George were described as virtually dictatorial, as unprecedented in recent British history, and in fact as exceeding those of any ruler of the present time. His appointment had been opposed by strong elements in Parliament but seemed to be approved by the public and was enthusiastically applauded in France. Radical measures of reform were announced, including the complete governmental control of liquor manufactures. Prominent business men were called to office. Especial confidence was inspired by the appointment of Baron Rhondda, a coal magnate, as President of the Local Government Board; of Baron Devonport as Food Controller; of Sir Joseph Paton Maclay as Shipping Controller; and by the choice of other experienced men of affairs. There was criticism of the choice of Mr. Arthur J. Balfour as Foreign Secretary, who was condemned by many on his record in the Admiralty, by those who demanded a more aggressive naval policy, but on his behalf it was urged that he was better versed in foreign affairs than any one else and that like Viscount Grey, he was friendly to the United States and would carry out the same policy of respect for the traditional spirit of international law.

**ATTITUDE TOWARD PEACE.** A good many significant declarations were made by prominent members of the government in the course of the year as to the terms on which the Entente Allies would consent to peace. The principal points insisted upon were the liberation of small nations, and the extinction of the Prussian military domination. This latter was interpreted by Mr. Asquith in a speech delivered before the visiting French senators and deputies in London on April 10th. He said: "As a result of the war we intend to establish the principle that international problems must be handled by free negotiation on equal terms, by the free people, and that this settlement shall no longer be hampered or swayed by the overmastering dictation of a government controlled by a military caste. That is what I mean by the destruction of the military domination of Prussia—nothing more, but nothing less." For an account of the discussion of terms of peace at the close of the year, see **WAR OF THE NATIONS**.

**GREECE.** A maritime kingdom in south-eastern Europe, lying between the Ionian and Ægean seas. It consists of 26 nomes, or departments, besides Crete and the new Turkish cession. Capital, Athens.

**AREA AND POPULATION.** The total population in 1879 was 1,973,768. The area previous to the Balkan wars was given at 64,657 square kilometers (24,964 square miles), with a population in 1907 of 2,631,952. The area, population (1907), and density of the 26 nomes, and also of Crete, together with figures of the new Turkish cession are given in the following table:

	Sq. km.	Pop.	D.
Acarmania and Ætolia . . . . .	5,225	141,405	27
Achaia . . . . .	3,136	150,918	48
Arcadia . . . . .	4,357	162,324	37
Argolis . . . . .	2,585	81,943	32
Arta . . . . .	1,383	41,280	30
Attica . . . . .	3,127	341,247	108
Beotia . . . . .	3,117	65,816	21
Cephalonia . . . . .	763	71,235	98
Corfu . . . . .	681	99,571	146
Corinthia . . . . .	2,370	71,229	30
Cyclades . . . . .	2,719	130,378	48
Elia . . . . .	2,014	103,800	51
Eubœa . . . . .	3,895	116,903	30
Eurytania . . . . .	2,322	47,192	20
Karditia . . . . .	2,647	92,941	35
Lacedæmon . . . . .	3,164	87,108	28
Laconia . . . . .	1,278	61,522	48
Larissa . . . . .	3,873	95,066	25
Leucas . . . . .	457	41,186	90
Magnesia . . . . .	2,084	102,742	51
Messenia . . . . .	1,674	127,991	76
Phocis . . . . .	2,157	62,246	29
Phthiotis . . . . .	4,622	112,328	24
Trikkala . . . . .	3,055	90,548	30
Triphylia . . . . .	1,593	90,523	57
Zante . . . . .	410	42,502	104
Turkish cession, including Crete . . . . .	55,400	2,066,647	37
	* 120,057	4,698,599	39

\* 46,345 square miles.

Greece took formal possession, March, 1916, of northern Epirus, which she had occupied, with the consent of the powers, in November, 1914. Besides Crete, with an area of 8618 square kilometers, the area acquired from Turkey includes the insular districts of Lesbos, Samos, and Chios, the estimated area of which is 4018 square kilometers, and, on the mainland, the districts of Saloniki, Kozani, Florina, Serres, Drama, Janina, and Prevesa, aggregating about 42,760 square kilometers.

The principal towns with their 1907 population, follow: Athens, 167,479; Piræus, 71,506; Patras, 76,724; Corfu, 27,397; Volo, 23,563; Larissa, 18,041; Trikkala, 17,809; Hermoupolis, 17,773; Pyrgos, 13,690; Zante, 13,580; Kalamata, 13,123; Chalcis, 10,958; Tripolitza, 10,789; Laurion, 10,007. Approximate population of the principal towns in the territory ceded by Turkey: Saloniki, 158,000; Candia, or Iraklion (Crete), 25,000; Canea (Crete), 24,200; Kavala, 23,400; Serres, 18,700; Janina, 16,800.

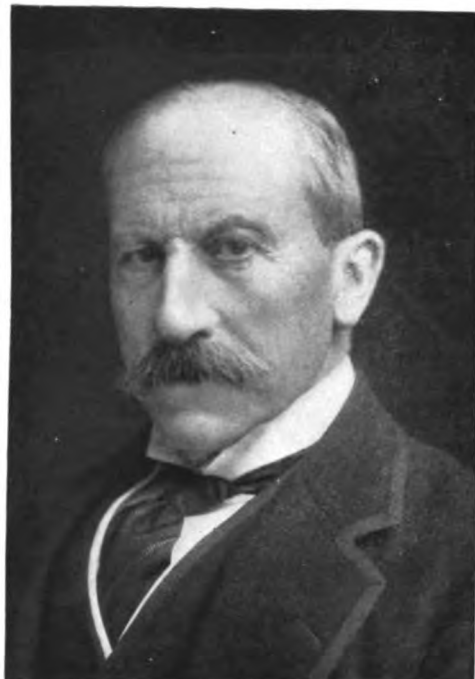
The emigration to the United States (United States records) has been as follows: 1913-14, 45,881; 1912-13, 38,644; 1911-12, 31,566; 1908-09, 20,262.

The national religion is the Orthodox Greek. Although the law provides for the compulsory instruction of children between the ages of six and twelve, it is not uniformly enforced; 30 per cent of army recruits are illiterate and 15 per cent can read only.

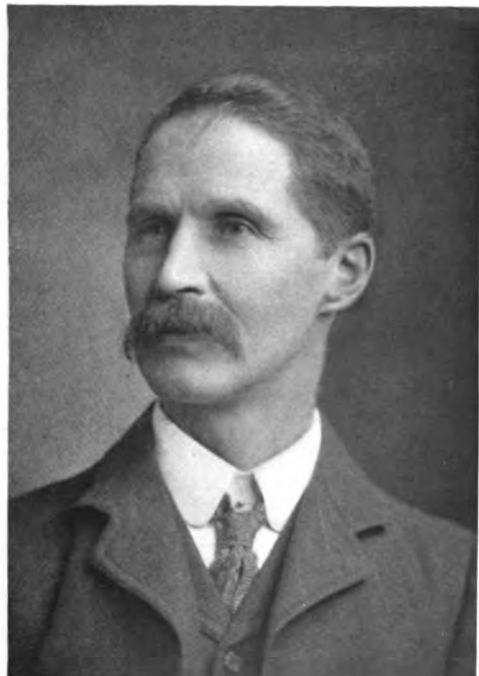
**INDUSTRIES.** The surface of the country is largely mountainous, and only about one-fifth of the total area is cultivable. Yet agriculture is the principal industry, though the methods are antiquated; the chief crops are currants, grapes, cereals, tobacco, citrus fruits, olives, and figs. The area of old Greece under cultivation



**ARTHUR HENDERSON**  
Minister without Portfolio



**LORD MILNER**  
Minister without Portfolio



**ANDREW BONAR LAW**  
Chancellor of the Exchequer



**EARL CURZON**  
Lord President of the Council

**FOUR MEMBERS OF THE WAR COUNCIL OF GREAT BRITAIN**



is given at about 5,563,000 acres—1,112,000 under cereals, 1,200,000 fallow, 2,025,400 under forests. There are in addition 5,000,000 acres under meadow and pasture. The principal crop is currants, with an annual average yield of 150,000 tons, which far exceeds the export; the surplus is utilized in the manufacture of denatured alcohol. The law limiting the output has resulted in the uprooting of many large plantations (estimated at about 35,000 hectares). The cereals grown are wheat, barley, rye, corn, and maslin. The output of currants in 1914 was 158,000 tons; olives, 50,000,000 oke (1 oke equals 2.85 pounds).

Live stock, as reported for 1914: horses, 149,000; mules, 79,500; asses, 132,800; cattle, 300,000; sheep, 3,546,600; goats, 2,638,000; swine, 227,200. Sericulture is carried on. In the territories rice and tobacco are largely grown.

Mining concessions cover a total of about 20,000 acres, and yield iron, manganese iron, iron pyrites, lead, nickel, zinc, magnesite, chromite, emery, etc.

COMMERCE. The trade for comparative years is shown in the following table, values in thousands of drachmas (the par value of the drachma is 19.295 cents):

	1910	1911	1912	1913	1914
Imports	160,536	173,510	157,657	177,938	175,135
Exports	144,571	140,908	146,163	119,001	117,134

The principal articles of import for consumption and exports of domestic produce are shown below, with value for the year 1913 in thousands of drachmas:

Imports	1000 dr.	Exports	1000 dr.
Cereals	31,496	Currants	40,663
Yarns, etc.	19,899	Tobacco	19,616
Fuel	18,985	Olive oil	15,317
Timber	14,566	Wine	12,510
Chem. prods.	7,932	Arg. lead	8,561
Mins. and meta.	7,526	Figs	6,017
Sugar	6,466	Zinc	5,698
Fish	5,969	Spirits	4,043
Coffee	4,087	Olives	3,948
Animals	3,083	Iron	3,495

The commerce of Crete amounted in 1913 to 21,910,000 drachmas imports, and 18,209,000 drachmas exports (102,835,000 drachmas imports and 81,458,000 drachmas exports in 1812).

The United Kingdom is the leading country of origin and destination. In the 1913 trade, she contributed imports valued at 42,502,000 drachmas, and received exports to the amount of 28,456,000 drachmas; Russia, 35,308,000 and 2,841,000; Austria-Hungary, 29,168,000 and 12,786,000; Bulgaria, 2,838,000 and 904,000; Germany, 13,322,000 and 12,191,000; France, 10,559,000 and 13,615,000.

COMMUNICATIONS. Railways open for traffic in 1914, about 1365 miles, made up as follows: Hellenic Railway, 275 miles; Piræus-Athens-Peloponnesus railway, 468 miles; the Thessalian Railway, 145 miles; Athens-Piræus railway, 6 miles; Attica Railway, 47 miles; Northwestern Railway, 40 miles; Salonica-Gevgeli, 49 miles; Salonica-Monastir, 125 miles; Salonica-Oxilar, 211 miles. Before the war with Turkey (1912-13) Greece was completely isolated by land from the rest of Europe, but it is now intended to connect the Greek with the European railways. The distance is only about 70 miles and the line would have been completed by July, 1915, but for the

European war. It was, however, opened in the spring of 1916 (May 21st). Projects for new lines to the extent of 400 miles are under consideration. Among the lines to be constructed are those from Salonica to Anghista, from Kalambaka to Koshani, from Kalambaka to Sorovichevo, and from Kalambaka to Janina.

The telegraph lines in 1914 had a length of 5735 miles, with 10,130 miles of wire. The number of offices was 795. Receipts, inland telegrams, 3,700,600 drachmas. In 1914 there were 1438 miles of telephone lines, with 5096 miles of wire belonging to six urban systems. Post offices at the end of 1914, 1342.

FINANCE. The 1915 budget is detailed below in thousands of drachmas:

Revenue	1000 dr.	Expenditure	1000 dr.
Direct taxes	56,784	War	58,516
Indirect taxes	113,019	Debt	56,695
Monopolies	18,181	Administration	16,330
Stamps	27,898	Finance	148,462
Dues	9,679	For. affairs	5,535
Pub. utilities	13,025	Justice	11,693
Domains	9,571	Interior	30,295
Various	3,560	Religion, etc.	17,559
Civil contrib.	5,838	Commerce, etc.	7,145
Surplus	3,701	Communications	43,161
Various extraord.	199	Marine	27,469
Total	261,405	Total	422,860

The public debt (Dec. 31, 1914) under control of the international finance commission amounted to 1,067,708,065 drachmas (919,214,000 drachmas gold, 148,494,065 paper): 125,213,637 drachmas not controlled by the international commission, and 145,000,000 drachmas floating debt—a total of 1,337,921,702 drachmas. Unofficially reported Dec. 31, 1915, £46,289,100.

GOVERNMENT. The reigning King, Constantine I, succeeded to the throne upon the assassination (March 18, 1913, in Salonica) of his father, George I, son of Christian IX of Denmark, who was elected king by the Greek National Assembly in 1863. Heir-apparent, Prince George, born July 19, 1890. Constantine married, Oct. 27, 1889, Sophia, Princess of Prussia, sister of the German Kaiser; he has complicated the neutral position of Greece in the European war by pronounced pro-German policies.

## HISTORY

THE GREEK GOVERNMENT AND THE ENTENTE ALLIES. On Jan. 13, 1916, King Constantine gave out to the press his views on the subject of the course of the Entente Allies toward Greece. He said first it was hypocrisy to speak of the violation of Belgian and Luxemburg neutrality on the part of Germany after the conduct of the Entente Powers in Greece. To occupy so large a portion of Greek territory was an act of aggression and the promise to pay for the damage done after the war was over was of no consequence. As to the plea of military necessity it was under that same plea that Germany had invaded Belgium and Luxemburg. Moreover, he said, there had been no military necessity for such acts as the destruction of the Demir Hissar Bridge, and the occupation of Corfu. The course of the Allies, he said, had alienated all the Greek sympathy they had ever had, and added another to the long list of blunders in their Balkan policy. He implied that in yielding to their demands in November the Greek government had been under duress.

Toward the close of 1915 there had been many arrests of alleged spies by the authorities of the Allies and both the German and Greek governments entered protests. Alleging that an air raid had been made by the enemy, the Allies arrested, on January 3rd, the German, Austrian, Bulgarian, and Turkish consuls. Some days before that the Norwegian consul had been arrested. King Peter of Serbia arrived in Saloniki on January 1.

On February 10th Premier Skouloudis laid down the policy of neutrality, saying Greece would fare far worse than under present conditions if she went to war. Former Premier Gounaris sustained this policy. On February 11th the Chamber voted for it by 266 to 6. By royal decree all Greeks belonging to classes from 1892 to 1914 inclusive, and living abroad, except those in Russia, Turkey, Bulgaria, and Rumania, were called to the colors. It was estimated that it would increase the army by 90,000 men.

Another difficulty with the Allies arose in April in consequence of their undertaking to transport Serbian troops from Corfu to Saloniki, by means of the Peloponnesian railroad. This was resented by Greece as a breach of neutrality, and the use of the railway was refused. On May 15th, however, the British Foreign Office announced that the differences between Greece and the Allies on this subject had been amicably adjusted and that there would be no violation of Greek neutrality.

In March a new difficulty arose with the Allies on account of the declaration of Premier Skouloudis that Greece had practically annexed upper Epirus. To this the representations of the Allies replied that that region had been made a part of Albania by joint act of the powers in 1913, and the Greek government then declared that its occupation was merely provisional.

**THE SKOULOUDIS CABINET.** The Skouloudis ministry seemed to be favorable to the Allies, the Premier having represented many times the desire of Greece to maintain a neutrality that would be sympathetic to the Entente Powers and the Allies hoped that the next step would be a ministry that would serve merely as the transition to the return of Venizelos. In May the fall of the Skouloudis cabinet definitely was predicted and there were some changes made in the ministry. For example, the Minister of Finance retired from office and was succeeded by the Minister of Justice, M. Rhallys. The latter took a gloomy view of the financial situation but did not propose new taxes. He met the 380,000,000 franc deficit and the heavy cost of mobilization, estimated at 900,000 francs a day, by merely revising the budget for 1916-17, and carrying out as far as possible measures of economy. The Venizelists showed a tendency to mingle again in public affairs and they assembled in a large, enthusiastic conference, but the government interfered and summarily broke it up under the pretext of disorder. From Venizelist sources it appeared that representatives of the pro-German party had been paid to cause disorder, and this gave the police a pretext for the suppression of the meeting. In Allied quarters it was believed that the forts surrendered to the Bulgars under orders from the Greek government, and secret documents unearthed toward the close of the year were published in support of the charge.

**INTERVENTION BY THE ENTENTE ALLIES.** The

capture of Fort Rupel and the series of forts along the northeastern frontier on May 26th (see **WAR OF THE NATIONS**) caused great consternation in Greece. At Saloniki there were processions carrying British, French, Serbian, and Greek flags, and mass meetings in which violent speeches were made, denouncing the government for its tame submission. The newspapers published protests and appeals were made to M. Venizelos to save the nation.

The Entente Powers now determined to blockade the Greek ports, seize Greek ships, and munitions, and force the demobilization of the Greek military. There was much disaffection among the troops in consequence of their desire to defend their soil against the Bulgars, and to carry out the terms of the Græco-Serbian Treaty. According to ex-Premier Venizelos this applied to the majority of the troops. They were also discontented on account of their lack of pay, for, owing to the bankrupt condition of the government, they were ill-clothed, and left without proper maintenance. Another grievance was that by mobilizing they were unable to vote in the December elections. To this fact was attributed the retention in power of Premier Skouloudis, and the Parliament. The action of the Allies was based by them on the treaties, which they asserted were binding on the reigning family, for the safeguarding of the Greek constitution and Greek integrity. In June it was announced that a French officer had succeeded the Greek commander of the port of Saloniki, and that Greek ships had been excluded from that port; also that Greek ships in French ports were laid under an embargo. The Greek government protested against this Allied interference in an indignant note addressed to the State Department at Washington, and the representatives of the Latin-American governments there. The protest declared that the Allies had, without explanation, violated "traditional principles"; that since June 6th, Greece had been under a limited blockade, her ships had been held up, searched, and taken to naval bases, and in some instances to distant ports, where they had been turned into transports for the Allies. It was complained that as a result Greek food supplies had been cut off, and the sea trade stopped. Further demands were presented by the Allies to the Greek government on June 21st, and a naval demonstration took place before the port of Athens. Meanwhile Premier Skouloudis had resigned and a new cabinet was formed under the former Premier, Alexander Zaimis, who was reported to be neutral, but in sympathy with the Allies. The new cabinet came into power on June 23rd. The elections were fixed for August 7th. On June 27th, the King signed the decree for the demobilization of the army in accordance with the demands of the Allies. (See **WAR OF THE NATIONS, Diplomacy.**) The acceptance by Greece of all these demands of the Allies was announced on June 28th. The Allied Powers contended that they did not require Greece to abandon her neutrality as was shown by their first demanding demobilization. They held that Greece had not shown loyal neutrality. In short, the view of the Allies was that the Greek crown was under German influence, and that German agents in the country were doing all in their power to stir up public feeling against the Allies. There had been, they said, instances of insults offered to their repre-



representatives in the street, and the police, it was said, had permitted demonstrations against the legations. On the night of June 12th the French and British legations had been surrounded by mobs conducted by a policeman in uniform, and it was said that the chief of police drove through the streets at the time of this German demonstration without taking any notice of it.

**ATTITUDE OF M. VENIZELOS.** After the Balkan wars M. Venizelos, according to the account of his attitude given by his supporters, had favored a pacific policy and expected a long period of peace, but after the outbreak of the war Greece was in great danger of attacks from Turkey and Bulgaria. It was his fear that the conditions fixed by the treaty of Bucharest would not survive, and especially lest Turkey might destroy all Greek influence in Asia Minor. Actuated by this fear M. Venizelos had secured from the Allies a recognition of Greek claims in Asia Minor, Sir Edward Grey having said in a note on Jan. 24, 1915, that he would consider favorably any proposal of M. Venizelos. Greece, however, could not enter the war at that time, unless supported by Bulgaria. M. Venizelos therefore tried to induce the King to follow the policy of ceding to Bulgaria Kavala and Drama, but the King would not accept this proposal. The effect of this refusal, the report went on to say, was to build up a greater Bulgaria, and to increase the danger that Greece would sink back into the same position that she held before the Balkan war. The King professed to believe that the Bulgarians would withdraw from the Greek territory after they had driven out their enemies, but the Venizelist party had no such faith. They argued that the Bulgarians should be driven out, and that this could only be done by making common cause with the Allies.

**FURTHER DEMAND OF THE ALLIES.** On November 16th Admiral du Fournet demanded that certain pieces of artillery be turned over to the Allies, and, having met with a refusal, addressed an ultimatum demanding the transfer by December 4th. The ministry under Professor Lambros, who had succeeded M. Zaimis as Premier, after a discussion in council, rejected this demand. On December 1st Admiral du Fournet landed a body of French marines at the Piræus. At first they were well received, but in the afternoon they were fired upon and for two days the city was the scene of fighting and rioting.

**ATTACK ON THE ENTENTE TROOPS AND ON THE VENIZELISTS.** The attack on the troops of the Entente Powers on December 1st and 2nd was reported in the British press as follows: The first hostilities occurred in the southern part of the city, where a French detachment held the depot of Roufus. The first shot, according to the Allies, had been fired by the Greeks. The Greeks at first admitted this, saying that one of their officers had lost his head, but later their journals denied it and attributed the attack to the Allies. The battle extended next to the eastern part of the city, where the Greeks suddenly fired upon the building of the Zappeion, with two gatling guns, placed in a little grove on a hill, while Admiral du Fournet and some French officers were stationed in front of the principal building. The Greeks, concealed in the gardens of the royal palace, fired from the rear, riddling the building with shots. At this

juncture the British marines, about 250 in number, came to the aid of the 150 French troops who had been stationed in that quarter for the past month. The loss of the Allies at this point was placed at three officers and twelve men killed and several wounded. In all parts of this quarter, the Anglo-French troops were at this time in a state of siege and would have had either to surrender or cut their way through, had not the fleet, about five o'clock in the evening, begun to fire shells over the city. Four of these shells fell near the royal palace, thus serving as a reminder to the authorities that the naval forces would come to the defense of the land troops. A new attack was begun by Greek civilians, the so-called Reservists, who fired upon the French officers in spite of the flag of truce. After the renewal of the conflict the Greeks employed cannon. Had not the fleet bombarded the city, the forces in the Zappeion quarter would have been annihilated. In the Piræus, where the city hall and the Standard Oil building were guarded by strong detachments of French and Italians, conditions continued calm. At Athens, in addition to the fighting above mentioned, there were many outrages in the streets. Every Venizelist who appeared in the streets was chased, beaten, and then thrown into prison. It was said that a thousand of them were thus treated and that a hundred were killed or wounded. The worst anarchy prevailed.

**THE VENIZELISTS.** Finding the government opposed to their view, M. Venizelos and four leading members of his party went to Crete, where a movement for the repelling of the Bulgarian invaders had been started. He said that his purpose was to head this movement and spread it throughout Greece, that he was not fomenting a revolution, and that he had no designs against the King or the royal family. Later in the year he appeared at Saloniki. On October 11th he explained that his course in this matter as well as that of his colleagues, Admiral Condouriotis and General Danglis, was due to the fear that if they were inactive they would seem to the citizens to acquiesce in the course pursued by the King, and they hoped that their action might be a final warning to him and that at the last moment he would change his policy. He did not declare that the other government had ceased to exist, but regarded Greece as a state with two coexisting governments. The personnel of the cabinet of the new provisional government was announced at the same time, M. Repoulis being Prime Minister.

A statement attributed to Venizelos on December 27th set forth the general attitude of his party and reviewed the grievances against the King. In the first place, he declared that the Greek refusal to abide by the treaty with Serbia was a dishonorable and impolitic act. The true policy for Greece demanded friendly relations with the Powers that ruled the Mediterranean. He said his followers had no quarrel with the dynasty but that Constantine had become a tyrant and had set up a reign of terror. Hundreds of Venizelists had, he said, been imprisoned and shot without trial. Constantine had become merely the leader of a party and the number of his followers and the strength of his army were dwindling. The Greeks in general were for the Allies. The Greek islands and the new parts of Greece were nationalistic and in old Greece the Venizelists were in a large ma-

jority but the King was trying to suppress them by force of arms. Venizelos wished to avoid disunion and to bend all his energies to fighting the Bulgars. On the part of the Allies he desired the recognition of his government which, he maintained, was supported by the majority, as the responsible government of Greece. He said that the fleet was almost wholly on the side of the Venizelists; and he urged the Allies to turn over to his government the Greek vessels, which they had seized.

**SITUATION AT THE CLOSE OF THE YEAR.** In King Constantine's reply to the peace note of President Wilson, he described the sufferings the country had sustained at the hands of both belligerents, despite its constant efforts to maintain neutrality. This showed, he said, how the Greeks longed for peace and how deeply they appreciated the President's endeavors. He promised a direct reply, supporting the American proposals. At this time the situation was again acute. The Entente Allies, according to a press dispatch on December 31st, presented the day before a note containing a demand for the following reparations and guarantees: Greek forces outside the Peloponnesus must be reduced to the number that was merely necessary for police duty and the arms and ammunition thus set free were to be sent to the Peloponnesus. Right of meeting was forbidden to all reservists north of the isthmus of Corinth and no civilian was to carry arms. The control of the Allies was to be reestablished. All political prisoners were to be released at once. The commandant of the first army corps must be dismissed unless it were found that some other general was culpable. Apologies must be publicly rendered by the government to the flags of the Allies. The latter agreed not to permit the nationalist forces to profit from the withdrawal of the royal troops from the neutral zone. Finally, the blockade of the coast was to continue till full satisfaction was given on all these points. The general situation had been discussed at a cabinet meeting over which the King presided on December 29th. Orders were at once given for the transportation of the Thessalian troops, and it was expected that this movement would be completed by January 5th, and that the Allies would then lift the blockade.

See ARCHÆOLOGY; WAR OF THE NATIONS.

**GREEN, HETTY HOWLAND ROBINSON.** An American financier, popularly known as the richest woman in America, died in New York July 3, 1916. She was born in New Bedford, Mass., in 1835, and came of a Quaker family. Her father, Edward Mott Robinson, became wealthy as a shipowner and merchant, and died in 1865 leaving his daughter a fortune of \$9,000,000. Soon afterward, her aunt, Miss Howland, died, and the will probated by relatives gave Hetty Robinson a life interest in an estate of several millions. She wanted it absolutely, and a bitter contest followed, in which she was beaten. Later she brought to the courts a will in her own handwriting, but with signatures that she swore were her aunt's. This was of earlier date, but it favored Miss Robinson and stated that it was to be considered in preference to any wills of earlier or later date that might be found. After some \$150,000 had been spent in costs and counsel fees, an agreement was reached. However, much bitter feeling had

been aroused among many relatives and neighbors, and Miss Robinson is said never to have returned to her birthplace. She had already become familiar with New York, for as a girl she had stayed there visiting relatives and had been prominent in social life. Her education had been gained largely at a private school in Boston.

In 1867 she was married to Edward H. Green of New York, at one time consul at Manila. He had a fortune of his own, and by prenuptial agreement their interests were kept separate. They went abroad, living in Paris and in London, where a son, Edward H. R. Green, was born. After their return, Mrs. Green took up personally the management of her growing financial interests; her husband finally went into bankruptcy, and they became estranged, but from 1898 till Mr. Green's death in 1902 they were again on friendly terms. It is said that Mrs. Green's ideas of severe economy were not pleasing to her husband. Certain it is that she early gained the reputation for penuriousness which continued to her death. It was for this she was known, as well as for her great wealth, which at the time of her death was computed to be at least \$100,000,000. Many stories have been told of her efforts to save personal expense. For years she lived in a small flat in Hoboken, N. J., and it was only just before the marriage of her daughter, who became the wife of Matthew Astor Wilks, that she took temporarily a suite in the Hotel Plaza. She often protested that if she did not live simply and in obscure places, so many people would be seeking her out that she would have no time for her business. For the same reason, she said, she never allowed her benefactions to be made public.

Hetty Green's fortune was built up through the acquisition of gilt-edged securities. She was cautious in her investments, which consisted largely of bonds and mortgages of the most reliable sort. Wall Street bankers had the highest opinion of her judgment. At the time of the great panic in 1907, and at other times, she was one of the heaviest money lenders. For a time she was a large stockholder in the Chemical National Bank of New York; later she was better known in connection with the Seaboard National, of which her son became a director. Her son had long been active in financial affairs, and it was Hetty Green's wish to make him the richest man in the world. Until a few days before her death, which occurred after several strokes of paralysis, she attended to her affairs. She had become an Episcopalian, and was buried beside her husband at Bellows Falls, Vt., which had been her legal residence.

**GREENLAND.** An island in the Arctic Ocean, a Danish colony. Area estimated at 849,420 square miles; population, 1911, 11,893 of whom 11,621 Eskimos and 272 Europeans. A British source gives 1914 exports to Denmark at £87,555, and imports from Denmark at £47,722.

**GRENADA.** The smallest of the (British) Windward Islands colonies. Area, 133 square miles; population, 66,750; 1914 estimate, 71,080. Cacao is the chief product for export. St. George's (4916 inhabitants) is the capital. Imports 1914, £272,126; exports, £333,374. Revenue, 1914-15, £93,799; expenditure, £95,-

661. Tonnage (1914) entered and cleared, 867,798, of which 860,178 tons British.

**GREY, EDWARD**, first VISCOUNT. A British statesman. During the year he was created a peer of the realm, having been known before as Sir Edward Grey. King George offered him an earldom, but in order to retain his family name and at the same time avoid confusion with Earl Grey, the former Governor-General of Canada, he requested a change to a viscounty. See WAR OF THE NATIONS, *Diplomacy*.

**GROSVENOR, WILLIAM MERCER**. An American Protestant Episcopal clergyman, died in New York City Dec. 9, 1916. He was born in New London, Conn., in 1863, graduated from Williams College in 1885, and three years later finished the course of the Berkeley Divinity School. In 1888-90 he was assistant rector of Grace Church, Brooklyn, then rector of Trinity Church at Lenox, Mass., until 1895, and afterward rector of the Church of the Incarnation in New York till 1911. In this year he was appointed dean of the Cathedral of St. John the Divine in the same city, and until his death this institution was his chief interest. Dr. Grosvenor never married. While he was dean, the cathedral building progressed to the completion of excavations for the nave. Honorary degrees came to Dean Grosvenor from Williams College and New York University. His body was interred in the crypt of the cathedral.

**GROUP INSURANCE**. See INSURANCE.

**GUADELOUPE**. A French colony composed of certain islands of the Lesser Antilles. Area, 1780 square kilometers (687 square miles); population (1911), 212,430. Capital, Basse-Terre. In 1913, imports and exports were valued at 20,174,930 and 18,287,489 francs respectively. The leading exports are cacao, coffee, and sugar. The budget for 1915 balanced at 4,670,290 francs. Debt, Jan. 1, 1915, 3,848,817 francs.

**GUAM**. A territorial possession of the United States. For administrative purposes Guam comes under the navy department, and to facilitate such administration the whole island, with the surrounding islands and keys, has been designated as a naval station. The Governor, who is a naval officer designated by the President, is also commandant of the naval station. The population of Guam exclusive of officers and enlisted men of the navy and marine corps and their families on July 1, 1916, was 13,491, of whom 13,285 were classed as "natives," and the remainder as "foreigners." Of the latter the larger number were Japanese, 104. Only 57 were classed as Americans. The death rate per thousand in 1916 was 21.3. The birth rate 46.7. Imports for the fiscal year ending June 30, 1916, exclusive of naval and military stores and supplies, was \$329,503, of which over \$33,218 was received from the United States and its possessions. The expenditures amounted to \$66,568. The principal export was copra, of which 958,958 pounds were shipped to Japan, and 982,610 to the United States. The principal imports were lumber, rice, flour, tinned and fresh meats, canned provisions, automobiles, kerosene and gasoline, liquor, tobacco, clothing, and cotton goods. The revenue of the insular government was \$91,816, and the ordinary expenditures were \$87,058. There were also expenditures from reserve funds of \$23,569 during 1916. A bank under the auspices of the insular government was founded.

Guam is a station of the Commercial Pacific Cable Company, and cables from Manila, Yokohama, Midway, and Yap Islands are landed there. A high power radio station is being constructed by the navy department and it is expected that the station will be opened for communication in April, 1917. The United States Department of Agriculture maintains an experimental station in Guam. The port of entry is Apra Harbor, 5 miles from Agana, the seat of government. Apra is closed to foreign vessels except by special permission of the United States government. During the fiscal year ending June 30, 1916, 33 vessels having a total tonnage of 120,224 visited the port. The Governor of Guam until April 20, 1916, was Capt. William J. Maxwell, U. S. N., who was relieved on account of sickness. Capt. Roy C. Smith, U. S. N., assumed office on May 30, 1916.

**GUATEMALA**. A Central American republic, bounded by Mexico on the north and west and bordering both the Caribbean Sea and the Pacific Ocean. Capital, Guatemala City.

**AREA AND POPULATION**. Pending the delimitation of the Honduran boundary, the area of Guatemala cannot be stated exactly. One estimate at present is 48,290 square miles, and another is 43,641 square miles. The estimated population Dec. 31, 1913, was 2,119,165. The census of Dec. 31, 1903, showed 1,842,134 inhabitants, of whom about 60 per cent were Indian and the majority of the remainder mestizo. Guatemala City, with suburbs, is supposed to have upwards of 100,000 inhabitants; Quezaltenango, 34,000; Cobán, 31,000; Totonicapán, 29,000; Esquintla, Chiquimula, Jalapa, and Zacapa, about 18,000 each; Santa Cruz del Quiché, 17,000; Jutiapa, 16,000. Births in 1915 are reported at about 78,000, and deaths about 54,000.

**EDUCATION**. As in all Latin-American countries, illiteracy is common, but during his long presidency Estrada Cabrera has sought to promote education. Elementary instruction is free and nominally compulsory. In 1914 there were 1878 public primary schools, with 64,387 pupils; in 1915, 1899 schools, with 65,904 pupils. The primary schools in 1915 were thus classified: kindergartens, 17; mixed schools, 465; elementary schools for boys, 503; elementary schools for girls, 491; complementary schools for boys, 34, and for girls, 37; training schools for boys, 20, and for girls, 6; night schools for workmen, 62; schools of arts and crafts, 3; rural schools, 261. There are a few secondary schools, a law school, a medical school, and several other educational institutions. There is no state church. The prevailing religion is Roman Catholicism.

**PRODUCTION AND COMMERCE**. In general, Guatemala is a country of much fertility. The most important crop is coffee, which, before the great war, was exported largely to Germany. The estimated yield of coffee in 1914 was 918,522 quintals (quintal=101.4 pounds); corn, 4,611,292; wheat, 546,532; beans, 184,426. Estimated banana yield in 1914, 7,933,487 bunches, and in 1915, 8,217,000 bunches. The following figures for estimated production are for 1915: beans, 180,000 quintals; Lima beans, 21,041; rice, 236,832; wheat, 270,000; pepper, 5643; refined sugar, 253,416; panela, 558,193; coarse granulated sugar, 38,391; molasses, 185,054. Reported number of live stock Dec. 31, 1915:

horses, 116,278; cattle, 619,895; sheep, 383,124; goats, 56,600; swine, 102,531. There are valuable forests, in which are worked rubber, chicle, dye woods, cedar, and mahogany. Mining and manufacturing have not attained any great importance.

The reported values of imports and exports have been as follows:

	1913	1913	1914	1915
Imp. . . . .	\$9,822,462	\$10,062,328	\$9,381,115	\$5,072,476
Exp. . . . .	13,156,538	14,449,926	12,754,027	11,566,586

The Guatemalan authorities add 25 per cent to the actual invoice value of imports at the maritime customs houses—an estimate covering freights, insurance, commissions, etc.; this addition is included in the foregoing import values.

The leading imports in 1913 were as follows, in thousands of dollars: cotton goods, 1755; ironware, machinery, and coal, 686; foodstuffs, provisions, and liquors, 507; drugs, 269; woolen goods, 253; linen goods, 222. Principal exports in 1913 and 1914 respectively, in thousands of dollars: coffee, 12,255 and 10,391; sugar, 349 and 354; cattle hides, 455 and 341; wood, 248 and 301; chicle, 151 and 227; rubber, 100 and 94; bananas, 826 in 1913. In thousands of dollars, imports from and exports to the United States in 1913 were 5053 and 3923; Germany, 2043 and 7654; United Kingdom, 1650 and 1600; France, 402 and 21. Similar figures for 1914 and 1915 are shown below:

	Imports		Exports	
	1914	1915	1914	1915
United States . . . . .	4,879	3,752	4,874	6,881
United Kingdom . . . . .	1,390	577	1,477	1,322
Germany . . . . .	1,843	146	5,413	50
France . . . . .	318	124	34	....

**COMMUNICATIONS.** Guatemala has a few good roads, but at any considerable distance from the railway bridle paths afford the usual means of communication and transport.

The railways of Guatemala are operated by the International Railways of Central America, a corporation formed in 1912, and representing a consolidation of the Guatemala Railway (195 miles), the Guatemala Central Railway (139 miles), the Occidental Railway (51 miles), and the Ocos Railway (22 miles). The company's main lines in 1916 extended from Puerto Barrios to Guatemala City, a distance of 194.5 miles, thence to San José de Guatemala, on the Pacific Ocean, a distance of 74 miles. The company is capitalized for \$40,000,000 and has issued bonds in the sum of \$10,850,000. It receives subsidies from the governments of Guatemala and Salvador, ranging from \$5150 to \$11,780 per mile. The Government of Guatemala may purchase the lines after the year 2002 at a price to be decided by arbitration.

An important improvement completed in 1916 and to become effective Jan. 1, 1917, was the newly located 12-mile line leading from Puerto Barrios to Manoca, where connection will be made with the International Company's former line to Guatemala City. The operation of the newly located line involved the utilization of the big tunnel that cuts the high grade at Corozo Hill, 7 miles from Puerto Barrios, thus reducing the gradient from nearly 5 per cent to 0.9 per cent. The reduced grade enabled the road to put into effect an improved passenger schedule,

and at the same time increased the drawing capacity of the engines and permitted betterments in the freight service. The new tunnel was 753 feet long, 16 feet in width, and 18½ feet in height.

Telegraphs in 1915, about 4200 miles, with 245 offices. Post offices, 389.

**FINANCE.** For the fiscal year 1914 revenue and expenditure were reported at 82,399,925 and 48,735,805 pesos (paper) respectively. The approximate average value of the paper peso, which was 9 cents in 1906, declined to 6 cents in 1914, and 2½ cents in 1915. The reported revenue for 1915 was 85,007,704 pesos, consisting of: customs receipts, 63,815,126 pesos; receipts from liquors, tobacco, etc., 10,479,796; other taxes, 6,224,629; telegraphs and telephones, 3,098,169; postal, 1,389,984. Estimated expenditure for the fiscal year 1916, 60,082,637 pesos. The largest disbursements are for the public debt and the army. The foreign debt, with arrears of interest, is reported at £2,357,063. Interest payments were resumed in 1914. The internal debt (1914) is stated at 117,853,635 pesos paper.

**GOVERNMENT.** The executive authority is vested in a president, elected for six years by direct vote. He is assisted by a cabinet of six members. The legislative power is exercised by the National Assembly (69 members) and the Council of State (13 members). Members of the Assembly are elected by direct vote for four years; members of the Council are in part elected by the Assembly and in part appointed by the President. The President in 1916 was Manuel Estrada Cabrera (born 1857), who succeeded to the executive office in March, 1898, and subsequently was elected for terms ending March 15, 1905, 1911, 1917, and 1923. His last election took place Jan. 12, 1916. There is a first designate and a second designate, elected by the Assembly, to act as president in case of the chief executive's death or disability. There was difficulty between Mexico and Guatemala during the summer on account of raids over the border and alleged maltreatment of Mexicans in Guatemala, but it was announced in June that the trouble had been adjusted and that friendly relations had been restored.

**GUAYULE.** See AGRICULTURE.

**GUIANA.** See BRITISH GUIANA; DUTCH GUIANA; FRENCH GUIANA.

**GUNS.** See MILITARY PROGRESS.

**GUNTER, JULIUS C.** Elected Democratic Governor of Colorado, Nov. 7, 1916.

**GYMNASTICS.** The eighteenth annual intercollegiate gymnastic championships were won by Princeton with a total of 22 points. Brown finished second with 13 points, and Pennsylvania third with 12 points. Other scores were: Yale 6, Chicago 5, New York University 4, Haverford 1.

Dual college meets resulted as follows: Princeton 41, New York University 13; Princeton 27, Pennsylvania 27; Navy 37½, Rutgers 16½; Navy 39, Haverford 15; Navy 32, Yale 22; Harvard 39, Dartmouth 24; Yale 33, Brown 21; New York University 33, Brown 24.

The winners in the Amateur Athletic Union championships were: Parallel bars, P. Hol, Norwegian T. and A. C.; rope climb, F. Seibert, Grace Club; side horse, Joseph Oessey, West Side Y. M. C. A.; tumbling, Arthur Nugent, National T. V.; horizontal bar, B. Jorgensen, Norwegian T. and A. C.; flying rings, Otto A.

Poll, National T. V.; club swinging, Lester McCloud, New York A. C.; all-around, Peter Hol, Norwegian T. and A. C. The team championship was won by the Norwegian T. and A. C. The National T. V. was second, and the New York T. V. third.

**HAAM, AHAD.** See JEWS AND JUDAISM, *Literary Events.*

**HÆMOBRRHAGIC SEPTICEMIA.** See VETERINARY MEDICINE.

**HAIG, SIR DOUGLAS.** See WAR OF THE NATIONS.

**HAITI.** A West Indian negro republic, occupying the western and smaller part of the island of Haiti. The eastern part constitutes the Dominican Republic. The capital is Port-au-Prince.

**AREA, POPULATION, ETC.** The area of the republic of Haiti is estimated at 28,676 square kilometers (11,072 square miles). The population, though not known with accuracy, is denser than in most of the other American republics. The number of inhabitants, according to an estimate of 1909 based on parish registers, was about 2,030,000; in 1912, the number was estimated at 2,500,000, but it is not unlikely that this figure is too large. About 90 per cent of the people are negroes; most of the remainder are mulattoes, who form the aristocracy of the country. Port-au-Prince is the largest city and chief port, having an excellent harbor; its inhabitants are supposed to number over 100,000. The population of Cap-Haitian is estimated at about 30,000; Les Cayes, 25,000; Gonaïves, 18,000.

Elementary instruction is free and has been nominally compulsory since 1910, but the educational system is very imperfect, and illiteracy is prevalent. There are about 400 national schools, besides private schools, and five lycées. The language of the educated classes is French, while that of the peasantry, many of whom show a retrograde tendency, is a patois. The people commonly profess Roman Catholicism.

**PRODUCTION, COMMERCE, ETC.** Possessed of a very fertile soil, Haiti is a country of large agricultural possibility, but agriculture is in a backward state, due to inadequate means of transport, to the unprogressive character of the people, and to chronic political unrest, which discourages the introduction of foreign capital and enterprise. The most important crop commercially is coffee, but its cultivation has been especially retarded by a large export duty. Other crops are cacao, sugar cane, tobacco, and cotton. There are several sugar mills. Rum and other spirits are distilled for local consumption. Valuable woods, especially logwood, are cut for export. Mining is almost entirely undeveloped, although the mineral resources of the country are considerable.

The value of imports (exclusive of those at the port of Jérémie) in 1915 was reported at \$4,344,763, as compared with \$7,612,792 in 1914. Export figures for these years are not available; the estimated value of exports in 1914 was upwards of \$11,300,000 and in 1915 \$13,000,000. For 11 months of 1915 imports and exports were stated to be \$3,653,868 and \$10,050,320 respectively. Imports are chiefly from the United States; exports are largely to France, while considerable amounts are sent to the United States and the United Kingdom. Before the great war exports to Germany were exceeded

only by those to France. For 1913, reported coffee export, 56,962,000 pounds; cotton, 4,266,000; cotton seed, 7,922,000; cacao, 3,989,000; honey, 1,231,000.

The length of railway, including light railway, is about 225 kilometers (140 miles); telegraph line, 124 miles; post offices, 88. The roads are very poor.

**FINANCE.** Duties on imports and exports, which form the greater part of the revenue, are payable in American gold. For the year 1914-15, the customs revenue is reported at \$4,980,746 and other revenue at 4,959,386 gourdes, as compared with \$4,788,368 and 4,978,003 gourdes in 1913-14. The paper gourde has a par value of 96.47 cents, but has depreciated to between 16 and 20 cents. The sanctioned budget for 1915-16 showed an expenditure of \$3,999,732 and 3,479,821 gourdes. Late in 1916 it was announced that, pursuant to an executive decree, the 1915-16 budget would be continued in force for the fiscal year 1916-17. Public debt July 1, 1914, \$25,892,181 and 13,534,812 gourdes. In September, 1915, a treaty between Haiti and the United States was signed, which placed Haitian finances virtually under American control and provided for an American receivership of Haitian customs.

**GOVERNMENT.** The executive authority is vested in a president, who, according to the constitution, is elected for seven years by the two Chambers of the National Assembly in joint session. The lower house of the Assembly is the Chamber of the Communes, members of which (99) are elected for three years by direct vote. Members (39) of the Senate, the upper house, are elected for six years by the Chamber of the Communes, from a list prepared partly by the President of the republic and partly by the electors. The treaty mentioned above provided for the establishment of a native constabulary under command of American officers. The President of the republic in 1916 was Philippe Sudre Dartiguenave, elected Aug. 12, 1915.

**HISTORY.** The treaty with the United States was ratified by the United States Senate on February 28th (see UNITED STATES, *Treaties*). For a long time there had been a serious conflict between President Dartiguenave and his cabinet on the one hand and the Parliament on the other as regards the framing of a new constitution in accordance with the treaty between Haiti and the United States. On May 29th it was reported that the government would resign if Parliament refused to accept the dissolution of the Senate, and if it continued to act as a legislative body instead of a constitutional one. The American commander of the forces in Haiti, Rear Admiral Caperton, supported the President, holding his dissolution decree to be valid. The legislators on the other hand refused to accept it. On May 5th the Haitian cabinet resigned, and a new ministry was appointed on May 10th.

**HALE, FREDERICK.** Elected Republican United States Senator from Maine, Sept. 11, 1916.

**HAMILTON, FRANKLIN.** See METHODIST EPISCOPAL CHURCH.

**HAMILTON COLLEGE.** A non-sectarian institution for the education of men at Clinton, N. Y. It was founded in 1812. In the fall of 1916 there were 220 students and 21 faculty

members. During the year two new professors were added, Dr. Flippen, history, and Mr. Faucher, English. The productive funds of the college amounted to \$1,200,000 and during the year it drew an income of \$85,000. The library contains 70,000 volumes. President, M. W. Stryker.

**HAMPTON NORMAL AND AGRICULTURAL INSTITUTE.** A non-sectarian co-educational institution for negroes and Indians (principally the former), at Hampton, Va. It was founded in 1868. The number of instructors in the fall of 1916 was 133 and the number of students 1839. This includes all departments, among which are a primary day school and a summer school. The productive funds of the institute amount to \$2,886,322 and the total income for 1916 was about \$427,000. The library has 43,100 volumes. In 1916 Maj. Robert R. Moton, commandant of cadets, left the institute to take Booker T. Washington's place at the head of Tuskegee. He was succeeded by Maj. Allen Wadsworth Washington. Major Washington entered Hampton as a student in 1885 and for some years he has been identified with the school, traveling on speaking tours in its behalf. He received training under army officers at Fort Monroe. He has been prominent in various organization for negro improvement. Hampton Institute has friends throughout the country organized into groups which are united in the National Hampton Association. During the year meetings have been held in New York, Boston, Philadelphia, and other cities. In New York a memorial meeting to Dr. Washington (a Hampton graduate) was held. Funds are being raised for an auditorium, to be a memorial to Robert Curtis Ogden, for many years president of the Board of Trustees of Hampton. The present president is William H. Taft. The principal of the institute is Hollis Burke Frissell.

**HANNAY, CANON JAMES OWEN.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, English.

**HARAHAN BRIDGE.** See BRIDGES.

**HARBORS.** See DOCKS AND HARBORS.

**HARDEN, MAXIMILIAN.** See GERMANY, *History*.

**HARDIE, WILLIAM ROSS.** A British classical scholar, died in Edinburgh May 3, 1916. He was born in 1862 in Edinburgh, and was educated there at the university and at Balliol College, Oxford, where he had a brilliant career as a student, winning some of the highest prizes and scholarships and being elected fellow of Balliol in 1884. There he remained as tutor till 1895, when he was called to Edinburgh to accept the chair of humanity. His scholarly work, evincing great literary gifts as well as profound knowledge, appeared in published form as: *Lectures on Classical Subjects* (1903); *Latin Prose Composition* (1908); *Silvula Academicæ, Verses and Verse Translations* (1912). St. Andrews conferred on him the honorary degree of LL.D.

**HARDING, WILLIAM L.** Elected Republican Governor of Iowa, Nov. 7, 1916.

**HARPIGNIES, HENRI JOSEPH.** A French landscape painter, died at Saint-Privé Aug. 29, 1916. He was born in Valenciennes in 1819, studied under Achard in Paris, and later in Rome, and first exhibited at the Salon in 1853. He did not receive general recognition for his work till comparatively late in life. Then he

was made commander of the Legion of Honor, was elected secretary of the Society of French Artists, and was awarded prizes at several exhibitions outside France, as well as the medal of honor at the Paris Salon in 1897. Some of his work was done in water colors. In the Luxembourg, Paris, are "Evening in the Campagna," "Le Saut de Loup," and "Moonrise," and in the Metropolitan Museum, New York, is another "Moonrise." Harpignies was particularly fine as a painter of trees.

**HARRIS, FRANK.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, English.

**HARRIS, NORMAN WAIT.** An American banker and philanthropist, died at his summer home at Lake Geneva, Wis., July 15, 1916. For most of his life he had been connected with the business and public life of Chicago. Born in Becket, Mass., in 1846, he graduated at 17 from Westfield Academy, Mass., and entered the insurance business. From 1867 to 1880 he served as secretary of the Union Central Life Insurance Company of Cincinnati, which he helped to organize. In 1882 he established the banking house of N. W. Harris and Company of Chicago, New York, and Boston, with headquarters in the first named city, from 1907 to 1913 he was president also of the Harris Trust and Safe Deposit Company of Chicago, and he held the same office in Harris, Forbes, and Company of New York. Mr. Harris became prominent as a liberal benefactor of religious, educational, and other institutions. He was prominent in his denomination, the Methodist Episcopal Church, and for long had been a member of the International Committee of the Y. M. C. A. His largest gifts were made to the Chicago Training School for Home and Foreign Missions, to Northwestern University, to the Field Museum, and to the Y. M. C. A. He claimed direct descent from Charlemagne, and descent from the Countess Adelia, the Fair Maid of Brabant, whom Henry I, King of England, married.

**HART, JAMES MORGAN.** An American philologist, died April 18, 1916, at Washington, D. C. He was born in 1839 at Princeton, N. J., graduated from Princeton College in 1860, and three years later took his A.M. there. The next year he received the degree of J.U.D. at Göttingen. For four years Dr. Hart was an assistant professor at Cornell, from 1876 to 1890 he held the chair of modern languages and English literature at the University of Cincinnati, and then returned to Cornell, where he remained till his retirement in 1907. He edited several German and English classics, and published, among other books: *German Universities* (1874); *Handbook of English Composition* (1895); *Standard English Speech in Outline* (1907).

**HARVARD UNIVERSITY.** A non-sectarian educational institution at Cambridge, Mass. It was founded in 1636. The enrollment of students in the fall of 1916 was 6306. The faculty numbered 892. The productive funds of the institution amounted to \$28,448,701 and the total income to \$3,019,602. There are 1,183,000 volumes in the library. In 1916 new courses were offered in the Harvard Summer School by Prof. George P. Baker (whose drama classes have become famous), and by Professors Copeland, Coolidge, Wilson, and Greenough. Ernesto Quesada was appointed professor of Latin-American history and economics for 1916-17, and Drs. Edward H. Nichols

and Charles A. Porter became clinical professors in the Medical School. The Medical School is to provide a new course in military medicine, to be conducted by Maj. Weston P. Chamberlain, U. S. A. Prof. Wallace C. Sabine was honored by being chosen exchange professor to France for 1916-17. On June 22nd gifts for the preceding academic year amounting to \$1,344,283 were announced. The 25-year class (this time that of 1891), presented to the university the customary \$100,000. The president of Harvard is A. Lawrence Lowell. See also RADCLIFFE COLLEGE.

**HVERFORD COLLEGE.** An institution for the education of men, at Haverford, Pa. It was founded in 1833 and is under the control of the Society of Friends (Quakers). In the fall of 1916 there were 25 instructors and 195 students. In productive funds the college has \$2,517,482, yielding an income of about \$98,000. The library contains 70,000 volumes. After more than 40 years in the service of Haverford, since 1887 as president, Dr. Isaac Sharpless resigned in 1916. His name will be given to a new Science Hall, to be erected in 1917. Prof. A. G. H. Spiers resigned to accept a chair at Columbia University, and his courses in Romance languages were taken by Dr. Joseph Seronde and Charles H. Livingston. The late T. Wistar Brown, president of the Haverford corporation and generous benefactor of the college, left to it \$409,321. The children of Gideon Scull gave \$146,000 to establish a chair in English constitutional history, and Henry Cope gave \$9040. Asa S. Wing of Philadelphia was elected president of the corporation.

**HAWAII.** POPULATION. The estimated population of the islands on June 30, 1916, was 273,623, a net increase of 75,714 since 1910. The population was divided as follows: Hawaiian 23,770, part Hawaiian 15,334, Portuguese 23,755, Spanish 3577, Porto Rican 5187, other Caucasian 16,042, Chinese 21,954, Japanese 97,000, Filipinos and others 22,152, army and navy 8852.

**COMMERCE.** The imports for the fiscal year 1916 aggregated \$34,098,210, compared with \$26,064,855 for 1915. The import of foodstuffs for home consumption were \$7,813,359, compared with \$8,739,609 for 1915, the difference being accounted for by the falling off in breadstuffs imported. The exports aggregated \$64,670,852, compared with \$62,368,356 in 1915. The sugar exports during the year amounted to 568,584 tons, valued at \$54,409,585, and pineapples at \$6,889,705, or a total of these two products of \$63,299,290, compared with a value in 1915 of \$59,272,129. Other principal products were as follows: Coffee, \$418,807; hides, \$259,623; rice, \$144,120; bananas, \$209,026. Customs receipts for 1916 amounted to \$1,161,057, compared with \$1,119,534 in 1915. Internal receipts yielded \$894,137, an increase over the year 1915 of \$159,555.

**EDUCATION.** During the year there were maintained on the islands 171 public schools with 804 teachers, and 80,235 pupils. The cost of maintenance of the schools was \$899,501. There were also 526 private schools with 324 teachers, and a total attendance of 7741. The number of pupils of all races in public and private schools was 36,529 in 1915, as compared with 37,946 in 1916, an increase of 1417. In addition to the schools already mentioned in

the Territory there are 112 Japanese schools, given over to the teaching of the Japanese language, and other subjects peculiarly Japanese. In these there were over 10,000 pupils.

**PUBLIC HEALTH.** The greater part of the health work of the islands is cared for by the territorial Board of Health, though some of it is handled by the local governments. There was a slight increase of 1.2 per cent in the mortality rate in 1916, which was largely due to an increase in the rate of cases of measles. There was a medical inspector appointed during the year. The Territory employs 26 physicians who visited during the year 11,283 homes, examined 19,628 school children, and vaccinated 3387. A complete sanitary survey was made of every dairy in the Territory. The work of compiling a sanitary code is under way, a commission having been appointed during the year.

**GOVERNMENT.** The government in 1916 created the Hawaiian National Park, which is the first national park lying outside the continental boundaries of the United States. In the park are included the three Hawaiian volcanoes, Kilauea, Mauna Loa, and Haleakala, in trust for protection and development with the Department of the Interior.

**Officers 1916.** Governor, Lucius E. Pinkham; Secretary of the Territory, Wade W. Thayer; Attorney-General, I. M. Stainback; Auditor, J. H. Fisher; Treasurer, Charles J. McCarthy; Superintendent of Public Works, Charles R. Forbes; Commissioner of Public Lands, B. G. Rivenburgh; President of the Board of Health, J. S. B. Pratt; Superintendent of Public Instruction, Henry W. Kinney.

**Judiciary.** Supreme Court: Alexander G. M. Robertson, Chief Justice; Associates, Ralph P. Quarles and Edward M. Watson; Clerk, James A. Thompson; Circuit Judges, Clarence W. Ashford, W. L. Whitney, Thomas B. Stuart, W. S. Edings, James Wesley Thompson, Lyle A. Dickey, Clement K. Quinn.

**Federal Officers:** District Judges, Horace W. Vaughan, Charles F. Clemons; Clerk, A. E. Murphy; Marshal, J. J. Smiddy; Collector of Customs, Malcolm Franklin; Collector of Internal Revenue, John F. Haley; District-Attorney, S. C. Huber.

**HAY.** As estimated by the Department of Agriculture the hay production of the United States in 1916 amounted to 109,786,000 tons, of which 89,991,000 tons was tame hay and 19,795,000 tons was wild hay. The tame hay was produced on an area of 54,965,000 acres at the rate of 1.64 tons per acre, and the wild hay on 16,637,000 acres, the average yield being 1.19 tons per acre. The farm value on Dec. 1, 1916, of the tame hay was placed at \$11.21 and of the wild hay at \$7.75 per ton, the total values at these prices being \$1,008,894,000 and \$153,411,000 respectively. The value of tame hay per ton has often been exceeded but the total value of the 1916 crop is the highest on record. As compared with 1915 the acreage of tame hay in 1916 was greater by 3,857,000 acres, the production by 4,071,000 tons, and the value by \$95,250,000. The supply of old tame or cultivated hay on farms on May 1, 1916, amounted to 11,030,000 tons or 12.9 per cent of the preceding year's crop, the largest May 1st holdings for the past seven years although the consumption during the year had been heavy.

Increased acreage was devoted to alfalfa and

Sudan grass. Nearly one-fourth of the tame hay of the country is alfalfa hay. Sudan grass is growing in popularity in sections of low rainfall. The State of Kansas is reported as already devoting over 20,000 acres to this grass. Imports of crimson clover seed into the United States for the year ending June 30, 1916, were less than half of those of the two preceding years and the imports of hairy vetch seed were also much reduced as compared with the imports of 1914 and 1915. On the other hand, the importation of red clover seed from July 1, 1915, to March 31, 1916, amounted to 25,815,357 pounds, an amount exceeding any previous importation in an entire year. There was a shortage of white clover seed in England owing chiefly to the cutting off of imports from enemy countries.

**HAY, LORD JOHN.** A British admiral, died May 4, 1916, at Fulmer, Buckinghamshire, England. The fourth son of the eighth Marquis of Tweeddale, Lord John was born at Geneva, Switzerland, in 1827, and entered the navy at 13. His early service was in the China war and before Sebastopol. By 1861 he had risen to be commodore of the East India station. Before this, however, he had entered politics, as member of Parliament for Wick (1857-59). From 1866 to 1871, also, he sat in the House, for Ripon, and he was several times a Lord of the Admiralty. While in command of the Channel Squadron in 1877-79 he took possession of and administered Cyprus (1878); in 1883-86 he commanded the Mediterranean station; for two years was commander-in-chief at Devonport; and from 1888 till his retirement in 1897 was admiral of the fleet. In 1886 he received the G.C.B.

**HAYES, CHARLES WILLARD.** An American geologist, died in Washington, D. C., Feb. 8, 1916. He was born at Granville, Ohio, in 1859, graduated from Oberlin College in 1883, and took advanced work at Johns Hopkins, receiving the degree of Ph.D. in 1887. Appointed in that year assistant geologist on the United States Geological Survey, he had risen by 1902 to be chief geologist, a post that he held until 1911. He resigned to become vice-president and general manager of the Mexican Aguila Oil Company, and at the time of his death was chief geologist of all of Lord Cowdray's oil explorations. In 1898-99 Dr. Hayes served as geologist to the Nicaraguan Canal Commission. He wrote numerous articles on theoretic and economic geology, and a *Handbook for Field Geologists* (1912).

**HEALTH.** See HYGIENE.

**HEAT.** See PHYSICS.

**HEDEMAN, JULES.** A French journalist, killed in the Verdun battle June 13, 1916. He was born in Rennes in 1869, of a Dutch father and a French mother. Removing to Paris, he became a naturalized Frenchman. He was a relative of the great journalist Henri de Blowitz, long Paris correspondent of the *London Times*. M. Hedeman's writings on international subjects began to attract attention in 1901, when he became London correspondent of *Le Matin*, and thereafter he was regarded as one of the most able writers in his field. At the opening of the great European war in 1914, he had been for nine years foreign editor of *Le Matin*. Immediately volunteering for service, he went into the trenches as a common soldier, but was soon made lieutenant for bravery. He continued to write occasionally on topics connected with the

war. In the United States, M. Hedeman was perhaps better known than any other French journalist of his time, and on various occasions he had been received at the White House, by Presidents Roosevelt, Taft, and Wilson. In 1914, when Huerta had been recognized as President of Mexico by several European governments, although the Wilson administration refused to follow their lead, Hedeman came to the United States, studied the situation, and wrote for *Le Matin* a vindication of the President's course, urging France to cling to its friendship with this country rather than to support Mexico. He was an officer of the Legion of Honor.

**HEIDENSTAM, VERNER VON.** See VERNER VON HEIDENSTAM.

**HEINE, HEINRICH.** See GERMAN LITERATURE. *New Editors.*

**HELL GATE BRIDGE.** See BRIDGES.

**HENDERSON, ARTHUR.** A British statesman, appointed minister without portfolio in Lloyd George's cabinet, formed December, 1916, and a member of the War Council. He has been a member of Parliament continuously since 1903, and was president of the Board of Education in the Asquith coalition cabinet in 1915, but resigned. He is secretary of the Labor party. See GREAT BRITAIN, *History.*

**HENRY, O.** See LITERATURE, ENGLISH AND AMERICAN, *Essays, etc.*, American.

**HEPBURN, WILLIAM PETERS.** An American legislator and expert on railway management, died at Clarinda, Iowa, Feb. 7, 1916. Born at Wellsville, Ohio, in 1833, he was early taken to Iowa, where he entered a printing office. Later he studied law, being admitted to the Illinois bar at 21. In legal practice, he had gained a reputation in Iowa before the Civil War, as prosecuting attorney of Marshall County and as district attorney of the Eleventh Judicial District. He served throughout the war, rising to be a lieutenant-colonel of cavalry. For two years he lived at Memphis, Tenn., but after 1867 at Clarinda, Iowa. A Republican in politics, Colonel Hepburn was first elected to Congress in 1880, after a contest which resulted in his receiving the nomination on the 385th ballot. He served as a Representative continuously until 1887, from 1888 to 1893 was solicitor of the Treasury, and from the latter year to 1909 was again in Congress. In the 58th to 60th Congresses Colonel Hepburn was chairman of the Republican caucus, and in the 59th and 60th he served as chairman of the Committee on Interstate and Foreign Commerce. While he held this post, he framed three important laws, the Hepburn Rate Law, the Public Health Act, and the Pure Food Act. The first of these, for which he is particularly known, increased the powers of the Interstate Commerce Commission, and required railroads to report annually to the government on their condition. Although just before his retirement, Colonel Hepburn advocated decreasing the powers of the Speaker of the House, as exercised by Speaker Cannon, he was essentially conservative and out of sympathy with the advanced ideas of the new Iowa leader, Albert B. Cummins.

**HEBERMANN, CHARLES GEORGE.** An American editor, died Aug. 24, 1916, in New York City. He was born near Münster, Westphalia, Germany, in 1840, came to the United States in 1851, and in 1858 graduated from the College of St. Francis Xavier, New York



City. He afterward taught at the City College, where he became professor of the Latin language and literature in 1869, and also librarian in 1873. He was appointed editor-in-chief of the *Catholic Encyclopedia* in 1904. He was president of the Catholic Club (1874-75) and of the United States Catholic Historical Society (1898-1913). He published editions of Sallust's *Bellum Jugurthinum* and *Bellum Catilinarium*, edited *Unpublished Letters of Charles Carroll of Carrollton* (1902), Thebaud's *Forty Years in the United States* (1904), Waldseemüller's *Cosmographia Introductio* (1907), *Historical Records and Studies*, 1 volume annually, and *Diary of a Visit to the United States by Lord Russell of Killowen* (1910); translated Torfason's *History of Vinland*; and wrote *Business Life in Ancient Rome* (1880). He also contributed articles to reviews.

**HEREDITY.** See **EUGENICS**; **INSANITY**; **ZÖOLOGY**.

**HERZEGOVINA, THE.** Part of the Austro-Hungarian territory of Bosnia and the Herzegovina. See **AUSTRIA-HUNGARY**.

**HESSE, RICHARD.** A German forester, died at Giessen, Jan. 18, 1916. He was born in Gotha in 1835, was educated at Aschaffenburg and at Göttingen, and when 23 years old entered the forestry service of Gotha. After 1868 he was for many years director of the Academic Institute of Forestry at the University of Giessen, where he was a professor. His most important publication is *Der Forstschutz* (1876-78; 3rd ed., 2 vols., 1896-99). His other publications include: *Grundriss zu Vorlesungen über Forstbenutzung und Forsttechnologie* (2nd ed., 1901); *Der akademische Forstgarten bei Giessen als Demonstrations- und Versuchsfeld* (2nd ed., 1890); *Die Eigenschaften und das forstliche Verhalten der wichtigeren in Deutschland vorkommenden Holzarten* (2nd ed., Berlin, 1895); *Encyclopädie und Methodologie der Forstwissenschaft* (Nordlingen, 1885-92)

**HESSE.** See **GERMANY**.

**HEWLETT, MAURICE.** See **LITERATURE, ENGLISH AND AMERICAN, Fiction, and Poetry, English**.

**HICKS-BEACH, SIR MICHAEL.** See **ST. ALDWYN, EARL**.

**HIDES.** See **LEATHER**.

**HIGH COST OF LIVING.** See **FOOD AND NUTRITION**; **PRICES**.

**HIGH SCHOOLS.** See **EDUCATION IN THE UNITED STATES**.

**HILGARD, EUGENE WOLDEMAR.** An American agriculturist, died Jan. 8, 1916, at Berkeley, Cal. He was born in Bavaria in 1833, but was brought as an infant to the United States. In 1853 he received the degree of Ph.D. at Heidelberg and later he studied at Zurich and Freiberg. From 1858 to 1872 he was State geologist of Mississippi, from 1866 to 1873 served as professor at the University of Mississippi; and then for two years he held a chair at the University of Michigan. But he was best known for his connection with the University of California, which lasted, actively, from 1875 till his retirement in 1900 under the Carnegie Foundation. From 1888 to 1904 he was also director of the California Agricultural Experiment Station, which was the first of its kind and which owed its existence to Professor Hilgard's persistent efforts. His success in interesting the farmers resulted in other stations and in

farmers' institutes. Of especial importance were his soil investigations—he published a standard book on *Soils of the Humid and Arid Regions* (1906). Professor Hilgard's distinction was recognized by his election to the National Academy of Sciences, by honorary degrees from Columbia and other universities, and by the award of the Liebig medal of the Academy of Sciences of Munich and of a gold medal at Paris in 1900. He was a cousin of the late Henry Villard, whose name was originally Hilgard.

**HILL, JAMES J (EBOME).** An American railway builder and capitalist, died at St. Paul, Minn., May 29, 1916. He was born at Guelph, Ontario, Canada, Sept. 15, 1838, of Scotch-Irish parentage. On the death of his father, which occurred when he was 15, he left Rockwood Academy to work on a farm. Three years later he decided to look for work in the United States, and after going from place to place observing conditions, he settled in St. Paul, then a small town, where he was first a stevedore and clerk for a river packet company. He began immediately to study the possibilities of transportation development in the Northwest. By 1865 he had become agent for the Northwest Packet Company, soon afterward representative for the St. Paul and Pacific Railroad, and in 1869 helped to organize the fuel and transportation business of Hill, Griggs, and Company. Although the railroad known as the St. Paul and Pacific had gained a reputation for being little more than a name, and certain Dutch financial backers had withdrawn their support so that in 1873 it went into the hands of a receiver, James J. Hill saw what could be made of it. He secured the interest of two Canadians subsequently famous, Donald A. Smith, later Lord Strathcona, and George Stephen, later Lord Mountstephen. With them, and the assistance of John S. Kennedy, a New York banker, he secured the property and proceeded to develop it. A three years' pest of grasshoppers, 1874-76, was followed by a remarkable harvest year, and farmers eagerly sought land along the railroad, which came to be known as the St. Paul, Minnesota and Manitoba, and later as the Great Northern. Of this Mr. Hill became president in 1882. His proposal to extend it westward to the Pacific was ridiculed, for there were already three transcontinental roads to the south, which had been aided by the government; but the proposal became a reality. Subsequently, to connect this road with China and Japan, a fleet of great ocean liners was built to operate from Puget Sound; also by way of the Great Lakes, connection with Buffalo was secured.

A bitter rivalry was carried on with the Northern Pacific, which finally collapsed in 1893, and was put in the hands of a receiver. If the Supreme Court of the United States had not held that such action would constitute the formation of a monopoly, the Great Northern would have absorbed its former rival. However, through the aid of J. P. Morgan and Company, virtually the same end was reached, by reorganizing the Northern Pacific and turning over control of it to the men controlling the other road. The Burlington Railroad was also obtained to give entrance to Chicago. For some years the formation of a holding company had been contemplated, to insure the then owners that their stock would have permanent control even after their death. A sudden check to this

plan was received when in the spring of 1901 it became known that Edward H. Harriman, backed by Kuhn, Loeb and Company, bankers, had instituted a struggle to get control of the Northern Pacific and the Burlington. May 9th of that year was the date of the great Northern Pacific corner. The battle ended in a draw, for it was found that while Harriman had not acquired a majority of the common stock and a majority of preferred, he had a majority of the two together. The attempt was then made by Hill to form a holding company, the Northern Securities Company. This was held to be illegal by the United States Supreme Court, in one of the most memorable of decisions regarding trusts, but it happened that the reorganization as required operated to Harriman's disadvantage.

James J. Hill came to be regarded throughout the Northwest and the country as not only a great railroad promoter, but a great developer of the resources of the land and of commerce, an "empire builder." He interested himself deeply in problems of farming. He found that in years of a poor wheat crop the result meant failure for the farmers, and consequent loss to the railroad. To set an example, he bought 1000 blooded bulls and 10,000 pedigreed hogs, which he distributed; and soon his road was making a record carrying live stock. One of the most remarkable aspects of Mr. Hill's genius was his ability to plan for the running of a railroad on the most thrifty and effective lines, as well as to project it. He took the road that became the Great Northern when it could be bought for \$300,000 (in 1879), and within four years it was valued at nearly \$40,000,000. The equipment was paltry and the total mileage was only 600. In 1893, when this had risen to 4300, the road was capitalized at \$143,000,000. Mr. Hill was ridiculed when he said that a railroad should be able to operate at a cost not exceeding 55 per cent of its gross earnings, but in 1898 the record of the Northern Pacific was 48.02 per cent. In 1907 he retired from the presidency of the Great Northern, and in 1912 from the chairmanship of the board of directors. His son, Louis W. Hill, took his place.

Mr. Hill was interested in a wide variety of public questions, and used to discuss his views for newspapers, and to make addresses, especially on the development of the land. He also published in 1910 a book called *Highways of Progress*. It was part of his scheme for arousing public interest and improving farm life to send over his roads cars for the demonstration of scientific agricultural methods. He had only the severest censure for inflated trusts, and was a strong advocate of national economy. Yale University recognized his services by the degree of LL.D in 1910, and at Harvard some of his friends established in his honor the Hill professorship of transportation. In 1908, before the Conference of Governors in Washington, he made a notable address on "The Natural Wealth of the Land and Its Conservation."

He made a number of large benefactions, chiefly to religious and educational institutions in St. Paul. A Presbyterian himself, his wife was a Roman Catholic, and he gave with equal generosity to Catholic and Protestant churches. He is said to have contributed, with his wife, \$1,500,000 to the new \$3,000,000 Catholic cathedral in St. Paul, and one of his other gifts was \$500,000 to build the St. Paul Theological Sem-

inary. He made a large and notable collection of works of art, which he housed in the gallery of his great home in St. Paul. At the time of his death, his wealth, including railroads and valuable iron mine interests, was estimated at between \$100,000,000 and \$250,000,000. During the long period while he headed the Great Northern, he never received a salary, but drew his income from the securities he owned, sharing in the benefit from increased value of the property.

**HILL, JOHN ALEXANDER.** An American publisher, died at East Orange, N. J., Jan. 24, 1916. He was born near Bennington, Vt., in 1858, but his family early removed to Wisconsin, and Mr. Hill entered a printing office at 14. For eight years after he was 20, he ran a locomotive, but his main interest was in printing and in the machinery for this trade. The year 1885 he spent in editing the *Daily Press* of Pueblo, Col., which he had founded, and after he had become known as a writer of his own experiences in railroading, he was called to become editor of the *American Machinist* (1888). This journal he bought, with Angus Sinclair, in 1896, and in 1902 Mr. Hill acquired *Powder* and organized the Hill Publishing Company. At the time of his death this corporation was housed in a great model building in New York, known as the "house of glass," in which even the machinery is painted white. The company acquired the *Engineering and Mining Journal*, the *Engineering News*, and founded the *Coal Age*. Mr. Hill introduced many important innovations into publishing policy, and did much to improve printing machinery.

**HINDENBURG, PAUL VON BENECKENDORF UND VON.** See WAR OF THE NATIONS.

**HISTORICAL ASSOCIATION, AMERICAN.** The thirty-second annual meeting of the Association was held at Cincinnati, Ohio, Dec. 17-30, 1916. At the same time, the American Political Science Association, the Mississippi Valley Historical Association, and the Ohio Valley Historical Association met. Prof. Jesse Macy, president of the Political Science Association, addressed a joint meeting on the "Scientific Spirit in Politics," and Prof. George L. Burr, president of the American Historical Association, spoke on "The Freedom of History." At different meetings, ancient, general, English, and American historical subjects were discussed. One session was devoted to "American Colonial Policy in the Philippines," another to "Medieval and Modern Constantinople," and a third, of particular interest at present, to "Great Peace Congresses of the Nineteenth Century." Of this meeting Prof. George M. Dutcher was chairman, and the Congresses of Vienna, Paris, and Berlin were discussed by Charles D. Hazen, William R. Thayer, and Robert H. Lord, respectively. Conferences were held of historical societies, of teachers, and of archivists. The Historical Association publishes an *Annual Report* and a quarterly journal entitled *The American Historical Review*. In alternate years the Herbert Baxter Adams and Justin Winsor prizes are awarded for monographs on European and American history, respectively. In 1916 *The Leveller Movement*, by Theodore C. Pease (awarded the Adams prize in 1915), was published. At the 1916 meeting the following officers were elected: President, Worthington C. Ford; first vice-president, William R. Thayer; second vice-president,

Edward Channing. Waldo G. Leland was re-elected secretary and Clarence W. Bowen treasurer. In 1916 there were 2900 members.

**HISTORY.** See section so entitled in articles on various countries; also FRENCH LITERATURE; GERMAN LITERATURE; LITERATURE, ENGLISH AND AMERICAN; etc.

**HITCHCOCK, GILBERT MONELL.** Relected Democratic United States Senator from Nebraska, Nov. 7, 1916.

**HOBART COLLEGE.** A nonsectarian institution for the education of men, at Geneva, N. Y. It was founded under Protestant Episcopal auspices in 1822. With it is affiliated William Smith College for women. In the fall of 1916 Hobart College had 122 students and 21 faculty members. The productive funds of the institution amount to \$748,891 and the total income from all sources for 1916 was \$90,000. The library has 59,000 volumes. President, Lyman P. Powell.

**HOCKEY.** The seven of the Boston Athletic Association won the championship of the Amateur Hockey League after a sensational struggle. When the regular schedule of games had been played the Boston team and the St. Nicholas Club of New York City were tied for the lead. In the play-off series Boston captured two of the three contests. The final standing of the clubs in the league follows: Boston A. A., won 8, lost 3; St. Nicholas, won 7, lost 3; Harvard Club, won 4, lost 4; Crescent A. C., won 4, lost 4; Hockey Club, won 0, lost 8.

The world's championship was captured by Les Canadiens after an exciting series with the Portland Oregon Club. Five games were necessary to decide the outcome, the scores being: Portland 2, Les Canadiens 0; Les Canadiens 2, Portland 1; Les Canadiens 6, Portland 3; Portland 6, Les Canadiens 3; Les Canadiens 2, Portland 1.

One of the strongest teams of the year was the Duquesne Garden aggregation of Pittsburgh, which won 20 games and lost only 3. The Cleveland, Ohio, seven captured 20 contests, lost 4 and drew 1.

Harvard again proved the best of the college teams.

**HODGE, JOHN.** See GREAT BRITAIN, *Government.*

**HOFFMANN, E. T. A.** See GERMAN LITERATURE, *New Editions.*

**HOG CHOLERA.** See VETERINARY MEDICINE.

**HOGS.** See STOCK RAISING AND MEAT PRODUCTION.

**HOLCOMB, MARCUS H.** Relected Republican Governor of Connecticut, Nov. 7, 1916. See CONNECTICUT.

**HOLLAND.** See NETHERLANDS.

**HOLY CROSS, COLLEGE OF THE.** A Roman Catholic institution for the education of men, at Worcester, Mass. It was founded in 1842. The instructors numbered 44 in the fall of 1916 and the students 597. The Rev. Francis X. A. Byrne, S.J., became prefect of discipline. The noteworthy benefactions of the year include \$10,000 each from the Rt. Rev. Thomas D. Beaven, class of 1870, and from Mr. Richard Healey. Productive funds amounting to \$82,675 yielded an income in 1916 of \$3000. The library contains 50,000 volumes. President, Rev. Joseph N. Dinand, S.J.

**HOME ECONOMICS.** See AGRICULTURAL EXTENSION WORK.

**HOME RULE IN IRELAND.** See GREAT BRITAIN, *History.*

**HONDURAS.** A Central American republic, bounded by the Caribbean Sea on the north and by Salvador and Nicaragua on the south, and touching the Pacific at the Gulf of Fonseca. The capital is Tegucigalpa.

**AREA, POPULATION, ETC.** Pending the delimitation of the Guatemalan boundary, the area of Honduras cannot be stated exactly. The figure that seems best for present acceptance is 114,670 square kilometers (44,274 square miles). The estimated number of inhabitants, who are chiefly Indian, was 592,675 at the end of 1913. There were 22,684 births in 1913 and 10,192 deaths. The largest town, Tegucigalpa, had 22,137 inhabitants in 1910 (1914 estimate, 28,950); Santa Rosa, 10,574; Juticalpa, 10,520; Danté, 8477; Nacaome, 8152; Choluteca, 8065.

Elementary instruction is free, secular, and nominally compulsory. The number of elementary schools reported for 1913 was 916, with an enrollment of 40,565 pupils, an average attendance of 25,917, and 1138 teachers. For secondary education the government maintains an institute at Tegucigalpa and subsidizes colleges in the departments. At Tegucigalpa also the government supports a so-called university and at Comayagua a law school. There are normal schools at Tegucigalpa, San Pedro Sula, Comayagua, Santa Rosa, and Santa Bárbara. Roman Catholicism is the prevailing religion, but there is no state church.

**PRODUCTION AND COMMERCE.** As reported in 1916, Honduras has over 3000 plantations and farms under cultivation, representing an area of about 117,300 hectares (about 289,400 acres), of which 15,400 hectares (38,000 acres) are irrigated. The most important crop commercially is bananas, which are cultivated especially along the Caribbean coast. The estimated banana crop of 1915 was 6,069,379 bunches. The corn crop provides the staple food of the people. Other crops are sugar cane, tobacco, coffee, coconuts, rice, beans, millet, and yucca. (See AGRICULTURAL EXPERIMENT STATIONS.) Grazing is an important industry; cattle numbered 489,185 in 1914, horses 68,059, mules 24,700, goats 22,778, and swine 180,092. Some gold and silver are mined, but there is little other development of the country's extensive mineral resources. Manufacturing is unimportant; the only manufactures of any account exported are cigars and Panama hats.

Imports and exports have been valued as follows in fiscal years:

	1913	1914	1915
Imports .....	\$5,132,678	\$6,624,930	\$5,874,780
Exports .....	8,300,254	8,421,331	8,857,857

The following figures, representing thousands of silver pesos, show for the fiscal years 1913 and 1914 the relative value of exports: bananas, 2759 and 1714; coconuts, 97 and 220; coffee, 62 and 116; hides, 77 and 160; cattle, 251 and 1914. Trade for fiscal years by principal countries, in thousands of dollars (gold):

	Imports		Exports	
	1914	1915	1914	1915
United States .....	5,262	5,177	2,974	2,987
United Kingdom .....	460	803	18	1
Germany .....	522	96	165	1
France .....	142	55	5	....

**COMMUNICATIONS.** Means of communication and transport are not at all adequate to the needs of the country. The repair and construction of roads is being carried on to some extent by the government, which in 1915 expended about 432,800 pesos on roads focusing at Tegucigalpa—one from the coast, another from Olancho, and a third from the direction of the National Railway via Comayagua. Tegucigalpa is the only Latin-American capital without a railway. The greater part of the railway in operation consists of lines built primarily for transporting the banana crop. The total length at the beginning of 1916 is reported at 517 kilometers. The most important line is the National, which extends inland from the coast at Puerto Cortés. In 1915 there was completed on this line a bridge over the Ulua River. Telegraphs (1914), 6890 kilometers (4281 miles) of wire, with 259 offices; as reported for the end of 1915, 7830 kilometers (4865 miles) of wire. Post offices, 278.

**FINANCE.** The standard of value is silver. The monetary unit is the peso, whose gold value fluctuates. At the beginning of 1914 it was worth about 43.4 cents; 1915, 39.8 cents; 1916, 35.4 cents. Revenue is derived chiefly from customs and from monopolies of spirits, tobacco, and explosives. For the fiscal year 1915, revenue and expenditure amounted to 6,682,891 and 6,461,467 pesos respectively, as compared with 5,895,194 and 5,774,415 pesos for the fiscal year 1914. The foreign debt, with arrears of interest from 1872, amounted to £30,803,868 at the end of 1914. The internal debt at the beginning of 1916 stood at 4,165,475 pesos.

**GOVERNMENT.** The executive authority is vested in a president, who is assisted by a cabinet of five members. The legislative power is exercised by a unicameral congress of 42 members. The president, the vice-president, and members of the congress are elected for four years by direct vote; the president is not eligible for the next term. The suffrage is held by male citizens over 21 years of age (or 18 years if married) who can read and write. On Feb. 1, 1912, Gen. Manuel Bonilla and Francisco Bertrand were inaugurated president and vice-president respectively. On March 13, 1912, Bonilla died and was succeeded by Bertrand. In 1915 Bertrand, with the consent of the Congress, resigned in order that he might become a candidate for the ensuing term; the executive authority was assumed by the vice-president, Alberto Membrefio, for the period Aug. 1, 1915, to Feb. 1, 1916. On Oct. 24, 1915, Bertrand was elected president and Membrefio vice-president by a virtually unanimous vote for the term beginning Feb. 1, 1916. Honduras is divided into 17 departments and one territory, which are administered by governors appointed by the president. See UNITED STATES, *Treaties*.

**HONGKONG.** A British crown colony; an island (about 32 square miles) off the southeast coast of China. Included in the colony are a strip of territory on the main land leased from China (376 square miles) and about four square miles of the Kowloon Peninsula. Civil population, 456,739 (Chinese, 444,664). Capital, Victoria (219,755). The island is the centre of an enormous trade. Being a free port, no trade returns are available, but a record of the shipping gives some idea of the extent of the trade.

The total tonnage entered and cleared in 1914 was 36,756,951, a decrease of 986,031 tons compared with 1913. There were 258,535 arrivals, of 18,383,764 tons, and 258,904 departures, of 18,373,187 tons.

Shipbuilding and repairing are important industries. A railway from Kowloon to the Chinese frontier joins the line from Canton. The total revenue (1914) is estimated at \$11,007,273; expenditure, \$10,756,225. Hongkong is well situated as regards telegraphic communication with all parts of the world. A railway from Kowloon joins the line from Canton at the frontier.

Proclamations dated Sept. 17, Oct. 1-29, Dec. 10-17-24 and 31, 1915; Jan. 21, March 17-24, 1916, have been issued by the Hongkong government, prohibiting export of raw cotton, corn or corn meal, oats or oatmeal, rice or rice flour, rye or rye flour, and wheat or wheat flour, to all ports in Europe and on the Mediterranean and Black Seas other than the United Kingdom, France, Russia (except through Baltic ports), Italy, Spain, and Portugal, and of linseed to all destinations other than the United Kingdom, British possessions and protectorates, Italy, France, and Russia (except through Baltic ports).

**HOPKINS, ERNEST MARTIN.** An American educator, inaugurated president of Dartmouth College, Oct. 6, 1916. He succeeded Dr. Ernest Fox Nichols, under whom he had served as secretary of the college.

**HOPS.** The hop yield of the United States in 1916 according to estimates by the Department of Agriculture was 50,537,000 pounds produced on an area of 43,900 acres, the average yield per acre being 1152 pounds. The corresponding figures for 1915 are given as 52,986,000 pounds, 44,700 acres, and 1187 pounds respectively. The farm value of the crop on Dec. 1, 1916, was 12 cents per pound, making the total value at this rate \$6,071,000 as compared with 11.7 cents per pound and a total value of \$6,203,000 the year before. Commercial estimates placed the yields in the principal hop producing States as follows: California, 112,000; Oregon, 90,000; Washington, 28,000; and New York, 10,000 bales of about 200 pounds each. The average production in New York was estimated at only about 500 pounds per acre. The supplies in New York State were so short that choice hops on account of the scarcity and the demands from brewers sold for 50 to 55 cents a pound, while in the Pacific Coast States the price ranged from 11 to 16 cents at the same time. These purchases were made to replace the Bavarian and Bohemian hops which could not be secured under the disturbed commercial conditions. By November practically the whole of the New York crop had been disposed of by the growers. The crop on the Pacific Coast was largely reduced by mold. In England the hop yield was only 308,000 cwts., one of the smallest on record. The hop crop of Germany was estimated at 16,534,000 pounds as compared with 30,751,194 pounds in 1915 and the yield in Austria at 21,053,930 pounds as compared with 20,613,010 pounds the year before. Many hop yards on the Continent, especially in Bavaria and Bohemia, were plowed up on account of unprofitable prices. For the year ending June 30, 1916, the breweries of the United States consumed about 37,500,000 pounds of hops.

**HORSES.** See STOCK RAISING AND MEAT PRODUCTION.

**HORSLEY, SIR VICTOR ALEXANDER HADEN.** A British surgeon and pathologist, died July 16, 1916, in Mesopotamia, where for several months he had been a medical consultant to the army. The son of a Royal Academician, he was born at Kensington in 1857, and received his professional training at University College Hospital, London. Among the offices he had held were: Professor-superintendent of the Brown Institution (1884-90); secretary to the Royal Commission on Hydrophobia (1885); Fullerian professor at the Royal Institution (1891-93); professor of pathology at University College (1893-98); and professor of clinical surgery at University College Hospital, from which post he retired in 1906. Sir Victor, who was knighted in 1902, received many other honors, including the Lannelongue international prize in surgery (1911), the royal medal of the Royal Society, the Cameron and Fothergill gold medals, honorary membership in the great scientific societies of the world, and university degrees. He made important contributions to the surgery of the brain and to the study of the ductless glands. One of his achievements was the discovery in 1884 that the disease myxœdema was caused by the absence of the thyroid gland. Sir Victor identified himself actively with public health movements, especially as concerning school children, national sick insurance, and temperance, and enthusiastically supported woman suffrage. His important writings were largely contributed to medical journals and the proceedings of societies.

**HORTICULTURE.** The year 1916 was one of low yields for fruits and vegetables generally. Most European countries reported a scarcity of labor to properly care for crops in special need of attention because of conditions favorable to plant diseases. The shortage was less severe in the Mediterranean districts, but transportation facilities were bad. Most of the fruit crops of Canada and the United States were below normal. The fruit districts of the Pacific Coast region suffered least from inclement weather conditions. The commercial vegetable crops, notably Irish potatoes and cabbage, were very short. According to the Bureau of Crop Estimates of the United States Department of Agriculture the nine leading cabbage-producing States had a production of 246,988 tons, with a farm value on December 1st of \$52.20 a ton in 1916, as compared with 670,631 tons, with a farm value of \$19.40 per ton in 1915. The potato crop was estimated at 285,437,000 bushels, with a farm value of \$1.46 a bushel on December 1, 1916, as compared with 359,721,000 bushels, with a farm value of \$.61 a bushel in 1915. The commercial apple crop in the United States amounted to about 30,000,000 barrels, as compared with 40,000,000 barrels in 1915. Less than 25,000 cars of peaches were marketed in 1916 as compared with about 45,000 cars in 1915. California shipped 45,234 cars of citrus fruits and about 18,000 cars of fresh deciduous fruits in 1916 as compared with 46,862 cars of citrus fruits and 16,778 cars of fresh deciduous fruits in 1915. Florida shipped about 24,000 cars of citrus fruits as compared with about 25,000 cars in 1915. The principal canned vegetable packs were 13,142,000 cases of tomatoes, 9,130,000 cases of corn, 8,686,000 cases of peas in

1916, as compared with 8,469,000 cases of tomatoes, 10,124,000 cases of corn, and 9,272,000 cases of peas in 1915. California packed 972,550 cases of asparagus in 1916 as compared with the largest previous pack of 800,380 cases in 1915.

**EXPORT TRADE.** For the fiscal year ending June 30, 1916, the United States exported fruits worth \$36,073,051; vegetables, \$15,952,412; nuts, \$892,277, or a total of \$52,917,740, as compared with \$45,746,268 in 1915. The imports for the same period were fruits, \$23,285,816; vegetables, \$10,811,393; nuts, \$21,160,491, a total of \$55,257,700, as compared with \$53,230,927 in 1915. British restrictions were responsible for reduced exports of fresh, canned, and dried fruits. The restrictions were partially removed on September 1st, shipments to be limited to 50 per cent of the previous year's exports. Of stocks required for the armies, such as beans, peas, and potatoes, \$9,399,938 worth were exported in 1916, as compared with \$5,984,257 in 1915. Nursery stock worth \$3,686,348 was imported in 1916.

The shipments of Australian fruits to Great Britain were replacing American shipments. For the fiscal year ending June 30, 1916, 411,198 cases of Australian apples were received in the port of Liverpool, as compared with 65,850 cases in 1915. In New Zealand, where the fruit industry was being rapidly extended, a law passed at the previous session of Parliament provided for the registration of every fruit tree in the dominion on or before Oct. 26, 1916. The trees were to be inspected for diseases, and orchards of one acre or more were to be taxed 24 cents per acre with the idea of using the income for developing the fruit industry in the dominion. Shipments of Portuguese dried figs to the United States in 1916 amounted to 10,670,888 pounds valued at \$431,288, as compared with 2,590,141 pounds valued at \$112,918 in 1915. The greater part of this fig crop usually was shipped to Germany and Russia by the way of Holland. The blockade of so many European markets also was responsible for greatly increased shipments of Spanish onions and olive oil to the United States.

**PLANT QUARANTINES AND REGULATIONS.** As a result of the work of the Federal Horticultural Board a number of insect pests and diseases have been detected recently in nursery stock imported into the United States, and the dangerous material has been rendered innocuous. New rules and regulations governing the importation of nursery stock into the United States were issued by the board and became effective on and after July 1, 1916. In the revised regulations permits were provided for the importation of nursery stock from countries which maintain nursery stock inspection and for the importation of orchids and tree seeds from those which did not maintain such inspection. These permits were valid until revoked. California declared an absolute quarantine against all imported citrus fruits, trees, buds, and scions. The quarantine was made primarily to prevent the reshipment from other States of citrus fruits from canker-infested districts of Florida. Early in the year Australia placed an embargo on American fruits. This was removed for the States of California and Arizona, providing that the quantity of the shipment must be made known and the fruit must be free from all citrus canker and disease. The Federal government made cooperative ar-

rangements with State officials of Florida, Texas, Louisiana, Mississippi, Alabama, Georgia, and South Carolina to insure the thorough inspection of nurseries and citrus groves for the purpose of promptly and completely eradicating citrus canker.

**MARKETING FRUITS AND VEGETABLES.** The results of fruit-handling investigations conducted by the United States Department of Agriculture during the past few seasons show that the most important factor in determining the condition of either fruits or vegetables in transit and after arrival on the market is the temperature maintained in refrigerator cars during transportation. The investigations during the past season have had mainly in view the improvement of refrigerator-car equipment. The results of the work thus far showed that through certain modifications in the ice bunkers, through the use of racks or false floors, and through better insulation, it was entirely practicable to increase the efficiency of refrigeration and to haul larger loads of fruit than formerly and with a lesser ice consumption. Probably the most important development in these investigations was the practicability of using small amounts of salt during the first two icings in cars with modified bunkers and racks, to accomplish a quick cooling, comparable to pre-cooling in either warehouses or car pre-cooling plants, with practically no extra cost and no delay for pre-cooling. Under this method the packed fruit was subjected to less handling and it made possible the long shipment of tree-ripened or more fully matured fruit in good condition, thus supplying the consumer with a product possessing its maximum fine quality. The Department's work in California during 1916 demonstrated the necessity of more careful handling of muskmelons. A large percentage of the deterioration in transit and on the market was traced directly to rough handling in the field and in the packing and loading sheds. When melons were picked before ripening, the deterioration was less than in riper fruit, but a large part of the crop reached the eastern market in a condition unfit for consumption.

A government market news service for perishable crops was established early in the year. Reports on carlot shipments of perishables were received daily at Washington and immediately telegraphed to the principal market centres. The information was made available at Washington and the field stations to national press associations and local papers. Shipping data, morning quotations, and other information from 31 markets covered by the service were furnished individuals and associations willing to pay the telegraph tolls. The commercial crops reported during 1916 included strawberries, tomatoes, cantaloups, peaches, onions, asparagus, watermelons, pears, prunes, grapes, apples, and white potatoes.

**RECENT DEVELOPMENTS IN SPRAYING.** The results of tests made under the direction of the Canadian Department of Agriculture showed that arsenate of lime might be used as a substitute for arsenate of lead as the insecticide in the usual lime-sulphur-arsenate of lead spray, and thereby greatly reduce the burning of apple foliage frequently caused by lime-sulphur and arsenate of lead. In view of the successful results secured during one season with hydrated lime as a substitute for stone lime in making

lime-sulphur spray for peach diseases, the Virginia Experiment Station recommended a trial of hydrated lime and sulphur to peach growers. The principal advantage to be gained was the saving of time and labor in preparing the spray. Experiments conducted for a number of years at the New York Cornell Station showed that the control of apple diseases and insect pests with dusting machines was somewhat less efficient than the liquid spray method; at the same time it was much more satisfactory for use in small orchards where expensive spraying equipment was out of the question, and also as an adjunct to liquid spraying equipment in large orchards where a large amount of spraying must be done within a short time. Underground piping systems for conveying spraying materials were being successfully used in some West Virginia and California orchards. The results reported by the Pennsylvania Station indicated that fruits and vegetables badly stained with Bordeaux spray might be rapidly cleaned by dipping them in a solution of acetic acid, used at the rate of half a cupful of pure acetic acid to two gallons of water. This results in the formation of acetates which are removed by passing the fruits or vegetables under running water. Experiments conducted by the United States Department of Agriculture showed that a decoction of *Amianthium muscaetoxicum*, known locally as fly poison or crow poison, when used as a spray will successfully control potato beetles and the fall web-worm.

**FRUIT BY-PRODUCTS.** During the year the Department of Agriculture completed a method for the manufacture of citrate of lime from lemons. The green fruit of tangerines was found to be valuable as a source of citric acid. A fine orange vinegar was manufactured on a small commercial scale. A machine was invented for the economic removal of the oil-bearing portion of the rind of waste and cull oranges and other citrus fruits. A simple, practical, and inexpensive method of manufacturing sweet-orange oil was devised. Studies in the manufacture of marmalade stock were undertaken and improved methods for the preparation of jams and jellies worked out. Much assistance was rendered manufacturers in improving their methods and utilizing their waste products.

**PROMISING FRUITS AND PLANTS.** The best recent fruit introductions tested on the New York State Experiment Station grounds included the Perfect apple, Rochester peach, Reine Hortense cherry, Empire State grape, and Herbert raspberry. The publishers of the *Missouri Fruit Grower* announced a Golden Winesap apple of high quality. The New York Station and also the New Mexico Station found it practicable to grow many of the high-yielding European grapes, commonly grown in California, by giving them some winter protection. The cheapest and best method of protection consisted in laying the vines down after leaf fall and covering them with a few inches of earth. At the Massachusetts Asparagus Substation a number of strains of asparagus were developed which possessed both excellent commercial characteristics and, to a high degree, the capacity to resist attacks of rust. At the Georgia Station, a pear of the Garber type, slightly superior to the Kieffer pear in quality, was found to be practically immune from blight. The Chinese downy chestnut trees (*Castanea mollissima*) distributed by the

United States Department of Agriculture in 1907 proved to have a high resistance to the serious chestnut blight so destructive to American chestnuts. The Chinese trees fruited and could be relied upon to furnish good nuts for the trade. The acquisition through the gift of the municipality of Tokyo of bud wood from the famous Arakawa collection of flowering cherry trees and their propagation on introduced Japanese cherry stocks put the Department in a position to give a wide trial in the near future to the hardiness of these superbly beautiful trees as dooryard and park trees. Inarched plants of the Chinese litchi first distributed in 1909 were fruiting in 1916 in Florida, where this fruit tree might be expected to live and bear if the young plants could be protected, or at least escape severe frosts until they had become thoroughly established. The quality of the fruits produced in the United States was excellent.

**INSTITUTIONS, SOCIETIES, ETC.** An organization to be known as the National Congress of Horticulture was effected at Washington, D. C., Nov. 17, 1916, as a result of a meeting of representatives of horticultural societies called by the American Pomological Society. The scheme of the organization in its entirety contemplates an actual congress meeting annually and having an active voting membership of from 500 to 600, with a corresponding attendance at its sessions, which would be business meetings for the discussions of the interstate, national, and international fruit, flower, vegetable, ornamental, seed, and plant problems of the United States.

Beginning with the current academic year, Vassar College offered courses in horticulture and landscape gardening. At Nebraska University courses in farm forestry and landscape gardening have been opened under the department of horticulture. Illinois University recently completed a genetics building and plans are under way for a horticultural field laboratory. During the summer the University of California let a contract for about \$100,000 for buildings at the new Citrus Experiment Station, at Riverside, Cal. The National School of Horticulture at Versailles has established a special section of gardeners' apprentices for retraining soldiers mutilated during the war. Applicants for this course are required to have more or less complete use of two arms and to have already had an agricultural or horticultural profession.

**NECROLOGY.** On August 3rd Jackson Dawson, one of the leading horticulturists of the country, died at Arnold Arboretum, Jamaica Plain, Mass., in his 75th year. Prof. William R. Lazenby, associated with the Ohio State University since 1881 and one of the pioneer educators in horticulture, died September 15th at the age of 66 years. Dr. Albert J. Cook, State horticultural commissioner of California since 1911, died September 29th, at the age of 74 years. The planting of 90,000 olive trees is the monument chosen by friends to commemorate Herzl, a prominent Zionist, and his work.

**Bibliography.** Among the contributors of 1916 to horticultural literature were the following: L. H. Bailey, *The New Standard Cyclopaedia of Horticulture* (vols. iv and v, New York); A. Pucci, *Enciclopedia Orticola* (vols. i-iv, 1910-1916, Turin); E. H. Wilson, *The Cherries of Japan* (Publ. Arnold Arboretum, No. 7); P. H. Rolfs, *Subtropical Vegetable Gardening* (New York and London); A. E. Wilkin-

son, *Muck Crops* (New York); M. G. Kains, *Plant Propagation* (New York); B. S. Brown, *Modern Propagation of Tree Fruits* (New York); T. W. Sanders, *Popular Hardy Perennials* (London); Harriet L. Keeler, *Our Early Wild Flowers* (New York); L. B. Holland, *The Garden Blue Book* (Garden City, N. Y.); S. F. Hamblin, *Book of Garden Plans* (Garden City, N. Y.); E. E. Rexford, *The Making of a Home* (Philadelphia); H. Findlay, *House Plants, Their Care and Culture* (New York and London); Cochet-Cochet and S. Mottet, *Les Rosiers* (4. ed., rev., and enl., Paris).

**HOSPITALS.** Among the great number of donations to hospitals made during the year 1916 a few of the more important may be mentioned here. The Johns Hopkins Hospital, Baltimore, received \$93,000 from Kenneth Dows of New York, to be given as an annuity for five years for the purpose of supporting a research fund. The hospital also received by the will of Miss Jessie Gillender, a gift of \$150,000, part of which is to be used in research work for the cause, prevention, and cure of epilepsy. The Norwegian Lutheran Deaconess Home and Hospital, Chicago, received \$71,550 in subscriptions from the staff of the hospital and from J. P. Hevland, Mrs. Elvira Lindeman, and James A. Patten. The New York Medical College and Hospital for Women received \$5000 by the will of Col. Edward M. Knox, \$1000 from Dr. Marshall O. Terry, a bequest of \$10,000 by the will of W. W. Cole, a donation of \$2000 by Dr. Cornelia C. Brant, and three donations of \$1000 each by other persons. St. Luke's Hospital, Chicago, received from J. Ogden Armour, \$100,000; Mrs. H. H. Walker, \$50,000; Samuel Insull, \$25,000; Prof. Robert Rousilton, \$25,000, and the trustees of the hospital \$95,000, all of which sums were to be devoted to the erection of a new building. The Presbyterian Hospital of New York received \$30,000, by the will of Mrs. Eveline A. Meserole; the Presbyterian Hospital of Chicago, \$50,000 by the will of Thomas Templeton; the Charles T. Miller Hospital of St. Paul, \$1,500,000 by the will of Mrs. Martha A. Miller. The Sisters of Charity of St. Vincent de Paul were left over \$300,000, by the will of Mrs. Mary Halloran for the formation of a branch of St. Vincent's Hospital at Stanford, Dutchess County, N. Y., for the treatment of cancer victims. The Lakeside Hospital, Cleveland, received \$250,000; the Charity and St. Alexis's Hospitals each \$50,000; and the Babies' Dispensary and Hospital, Tuberculosis Free Dispensary, and Maternity Hospital, each \$25,000, by the will of Robert R. Rhodes, Cleveland. Ogdensburg (N. Y.) City Hospital received as an endowment a gift of \$130,000 by the will of A. Barton Hepburn. The Presbyterian Hospital of Chicago received \$150,000 by the will of James Longley of Boston; the Children's Memorial Hospital, Chicago, \$25,000 by the will of Bryan Lathrop. To Mt. Sinai Hospital, New York, was given \$150,000, for the endowment of a department of surgery of the stomach; St. Mary's Free Hospital for Children, New York, \$80,000, and St. Luke's Hospital, New York, \$25,000, by the will of Mrs. Mary Van Nest Jackson; the New York Eye and Ear Infirmary, \$10,000, by the will of Mrs. Serena Rhineland; New York Postgraduate Hospital and Montreal General Hospital, each \$50,000, by the will of John Torrence Venneck. Francis S. C. A. Ripley, left the Long Island College Hos-

pital \$20,000, and to the Brooklyn Hospital, \$12,000. It was announced that the Guggenheim brothers gave \$165,000 to Mt. Sinai Hospital of New York, for the erection of a private pavilion. The new building will be seven stories in height, and will have a frontage of 200 feet on Fifth Avenue overlooking Central Park. To the University of Pennsylvania Hospital was left a fund of more than \$3,000,000 for the treatment of cancerous, nervous, and disabling diseases. The fund constitutes her estate and its increment is willed for the purpose stated by Anna J. Jeanes, a noted Quaker philanthropist, who died in 1908. Episcopal Hospital, Philadelphia, received \$50,000, by the will of Marie S. Wilson. The New York Skin and Cancer Hospital received \$50,000, and the Hahnemann Hospital, \$25,000 by the will of Martha H. Andrews; the Presbyterian Hospital of New York, \$25,000, by the will of Mrs. Caroline A. Wilson. The will of the late John Fitzgibbons provides \$100,000, for the establishment of a city hospital at Marshall, Me. St. Luke's Hospital, New York, by the will of Mrs. Ellen Stebbins Curtis James, received \$100,000; Auburn (N. Y.) City Hospital, \$20,000, by the will of Caroline Willard; Pennsylvania Hospital, Philadelphia, Protestant Episcopal Hospital, Presbyterian Hospital, Polyclinic Hospital, and Samaritan Hospital, each \$10,000; Philadelphia Home for Incurables, Jewish Hospital Association, and Medico-Chirurgical Hospital, each \$5,000, by the will of Hall Engles. The bequests to the Pennsylvania and Presbyterian hospitals are to endow two free beds in each institution in memory of Mrs. Engles's mother, and two free beds in memory of the testator. Mt. Sinai Hospital, New York, \$150,000, for the endowment of its department of abdominal surgery received from Charles A. Wimpfheimer. Mrs. Sarah C. Hunsberger gave to the Allentown (Pa.) Hospital a donation of \$50,000. New York Postgraduate Hospital received a gift of \$100,000, from Mrs. Alfred G. Vanderbilt for an additional building to cover a 20-foot plot. It will be five stories in height and will be equipped as a babies' ward. Lowell (Mass.) General Hospital received a donation of \$200,000 from Frederick Fanning Ayer. On October 14th, the new Masonic Memorial Hospital of Elizabethtown was turned over to the Grand Lodge of the State of Pennsylvania. This hospital was contributed by the Philadelphia Masons, and the cornerstone of the institution was laid September 20th. The building is a three-story granite structure, and is arranged to accommodate 38 patients. The cost of the building was \$60,000. Two other buildings will be erected in the near future, at a total cost of \$200,000. The completion of the new \$300,000 addition to Mercy Hospital of Chicago was announced June 4th. The new building is four stories in height and is designed especially for the care of sick children. The new wing of the Methodist Episcopal Hospital of Indianapolis was opened October 12th. It is a five-story structure with a roof garden and devoted entirely to private patients. The City and County Hospital of Hobart, Oklahoma, was opened for the reception of patients on June 21st. The new home of the New York Orthopedic Dispensary and Hospital, on East Fifty-ninth Street, which cost nearly \$1,000,000, was formally opened on January 31st with an address by Col. Theodore Roosevelt, whose father was one of the

founders of the hospital 50 years ago. Dr. Russell A. Hibbs, in his address, stated that during 1915 the dispensary had treated 10,313 persons and that 630 had been treated in the hospital, and that although \$1,000,000 of the \$1,500,000 needed was forthcoming, three of their wards must remain vacant, with 150 patients waiting for beds.

Innumerable hospitals have been called into existence by the European war. In its earlier stages the war imposed a much greater strain on France than on England, the latter having comparatively few troops in the field, but there were during 1916 no fewer than 27 hospitals in France, established, administered, and supported by British voluntary effort. The following list has been given by the *Gaulois*: The Urgency Cases Hospital at Bar-le-Duc and the Arcen-Barrois Hospitals; the Hôpital Herbert Ward at Rolleboise; the Hôpital Lady Wemyss at Canly; the British Ambulance Committee at Gerardmer; the Hôpital Franco-Anglais (Lady Murray) at Treport; the Hôpital Fitzgerald at Passy; the Trianon Hospital at Versailles; the Hôpital de l'Alliance at Yvetot; the Hôpital Anglo-Ethiopien at Frevent; the Hôpital du Château de Bearn established at St. Cloud by Lady Hartwell; the Allhusen Hospital at Ceret; the Hôtel du Château d'Anuel near Compiègne; the Joint Anglo-French Hospital and Hôpital Civile de la Clayette; the Florence Fiennes Hospital at Malo-les-Bains; the Scottish Women's Hospital at Chanteloup; the Johnstone-Reckitt Hospital at Ris-Orangis; the Hôpital du Château de Rozières near Nanteuil-le-Haudouin; the Hôpital de Château de Blancat at Pau; the First Aid Nursing Yeomanry Hospital at Calais; the Lady Sykes Hospital at Canly; the Hôpital d'Hardelot near Boulogne, founded by the Duchess of Rutland; the Surgical Ambulance of Rosebruge (Mrs. Borden-Turner); the Hôpital Canadien No. 4 at St. Cloud; the Hôpital Anglais No. 307 at Neuilly-sur-Seine; the Hôpital Irlandais at Cezaincourt; and the Hôpital Anglais No. 6 at Nevers. The latest achievement of medical science for the succor of wounded soldiers is a motor field operating theatre, which is being presented to the Italian government by the Wounded Allies Relief Committee of this country. The vehicle, which is the first movable operating theatre to be constructed, has been designed by a well-known surgeon and prominent politician, Sir William Collins. The huge body is mounted on a four-ton chassis of 25 horse power. Its outstanding characteristics are completeness and compactness, with a view to use in any weather and in any climate. The entrance for the surgeon and his assistants is from behind the driver's seat, and leads immediately to a small compartment which is devoted solely to the sterilization of water, instruments, and complementary vessels, while storage is provided for dressings. See also ARCHITECTURE.

**HOTELS.** See ARCHITECTURE.

**HOURS OF LABOR.** See CHILD LABOR; LABOR LEGISLATION; WOMEN IN INDUSTRY.

**HOUSE FLY.** See ENTOMOLOGY.

**HOUSES.** See ARCHITECTURE.

**HOWARD UNIVERSITY.** A co-educational institution at Washington, D. C. It is nonsectarian and open to both men and women without regard to race, but is chiefly known for the education of negroes. In the fall of 1916 the faculty numbered 112 and the student body 1,396.



For the academic year 1915-16 the productive funds amounted to \$309,413 and the income for all current purposes to \$211,157. The library has about 31,400 volumes. President, Stephen M. Newman.

**HOWE, JULIA WARD.** See LITERATURE, ENGLISH AND AMERICAN, *History, etc.*, American.

**HOWELLS, WILLIAM DEAN.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction and Essays, etc.*, American.

**HOWISON, GEORGE HOLMES.** An American philosopher, died Dec. 31, 1916. He was born in Montgomery County, Md., in 1834, graduated at Marietta College in 1852 and at the Lane Theological Seminary in 1855. After holding positions at Washington and Harvard Universities, the Massachusetts Institute of Technology, and at the University of Michigan, he was Mills professor of philosophy at the University of California from 1884 to 1909, retiring in the latter year. In philosophy he accepted in the main the doctrines of Kant, but in developing them on original lines arrived at a personal idealism in which reality is a community of spirits sharing a common ideal eternally realized in God, the highest Spirit. He was one of the most successful philosophical teachers in the United States, his pupils being found in many colleges and universities. He organized the Philosophical Union of the University of California, a philosophical club before which addresses had been given which were subsequently enlarged and published as important treatises. William James first propounded his pragmatism before this Union. Professor Howison's publications include: *A Treatise on Analytic Geometry* (1869); *Limits of Evolution* (1901, 2nd ed., 1905); *Philosophy: Its Fundamental Conceptions and Its Methods* (in vol. i, Congress of Arts and Sciences, St. Louis Exposition, 1904), 1905. He also edited and contributed to Royce's *The Conception of God* (1897), and edited the publications of the Philosophical Union and the philosophical publications of the University of California. See PHILOSOPHY.

**HOWITZERS.** See MILITARY PROGRESS, *United States.*

**HUDSON, CLAUDE S.** See CHEMISTRY, INDUSTRIAL, *Medals.*

**HUERTA, VICTORIANO.** A Mexican soldier and dictator, died Jan. 13, 1916, at El Paso, Texas. A full-blooded Indian, and all his life proud of his race, he was born at Colotlán, State of Jalisco, Mexico, Dec. 23, 1854. As a boy of 17, he was taken by General Guerra to be his amanuensis, and later he attended the Chapultepec Military College. It is said that soon after Huerta's graduation, Porfirio Diaz, who had become President of Mexico, sent for him and offered him any post he wished. He chose that of chief of the geographical or topographical bureau. During a long period he made surveys of the country, gaining a remarkably intimate knowledge of its natural features. His success in this work brought him promotion to captain of engineers; later, after he had seen service as a soldier against the Yaqui and Maya Indians, he became brigadier-general. In 1911, when Diaz saw that his fall was inevitable, he sent for Huerta and was conducted safely by him to Vera Cruz.

To the new President, Francisco Madero, Huerta then gave his allegiance. He was placed

(1912) in charge of the campaign to put down Pascual Orozco, who had revolted. Temporarily the rebellion was quelled, and when it again gained headway Huerta won the decisive battle of Bachimba, returning to receive the praise of government and people and to accept the rank of general of division. In February, 1913, came the revolt of Felix Diaz. Madero had fled to Chapultepec, but he was brought back by Huerta, who was given entire charge of the loyal forces in Mexico City. For 10 days a battle raged in the streets. Some of the Maderistas charged that the defense was conducted in a half-spirited way and that Huerta had already agreed with Diaz to bring about the fall of his chief. Another version reads that Huerta could not tolerate the leniency shown Diaz. However that may be, a plot was formed and Madero and his brother Gustavo were seized.

Supported by the army, Huerta declared himself Provisional President of Mexico on Feb. 18, 1913. Within five days, as they were being conveyed from the palace to prison, the two Maderos and José María Pina-Suárez (former Vice-President) were murdered while under armed guard. Huerta never cleared himself, in the eyes of the world, of responsibility for this act, although he stated that he had tried to prevent the crime. The United States was sufficiently aroused to demand that President Taft intervene, but he was just about to leave office, and was unwilling to embarrass his successor. President Wilson refused to intervene, but he also refused to recognize Huerta as de facto President of Mexico. Great Britain and several other European powers had granted recognition.

Soon Huerta had his hands full with revolutions set going by Venustiano Carranza and Francisco Villa, and by Emiliano Zapata. The American ambassador, Henry Lane Wilson, who advised recognition, was recalled and in the following August (1913) John Lind, formerly Governor of Minnesota, was sent by President Wilson as his personal representative, to make certain demands of Huerta. The chief proposal was that the dictator would consent to a regular election for President in which he himself would not be a candidate. This Huerta flatly refused to do. When his high-handed actions were being investigated by the Congress, he arrested half of the deputies and dissolved the legislature, assuming dictatorial powers. An election was then held, but only Huerta's sympathizers were allowed to vote.

While United States warships were in Mexican waters to protect American interests threatened by the conflict of the various factions, part of the crew of the *Dolphin* were arrested in Tampico (April 9, 1914) and although they were quickly released when it was explained that they had come ashore for gasoline, Admiral Mayo thought fit to demand an apology and a salute to the flag of the United States. In this he was supported by the administration. Huerta failed to comply and finally refused to give the order to salute. On April 21st American marines and sailors landed at Vera Cruz, and after a sharp engagement in which eight Americans were killed and a number wounded, and 200 Mexicans lost their lives, they occupied and administered the city. Mediation offered by Argentina, Brazil, and Chile accomplished nothing definite at the "A. B. C." conference held at Niagara Falls. Within a few months, Huerta's hold on the pres-

idency had become so precarious that by July 15th he thought it wise to resign. Shortly thereafter he sailed for Spain.

March 3, 1915, marked the beginning of what was apparently an attempt on the part of the exiled dictator to regain his hold in Mexico. On that date he left Spain, supposedly for the West Indies; but after a short stop at Algeciras, Morocco, he started for New York, on a "pleasure trip," so he said. For some time he and his family lived in Forest Hills, L. I. His next move was a journey West, with the announced intention of visiting the Panama-Pacific Exposition. At Newman, N. Mex., on June 27th, a United States deputy marshal arrested him, charging that, using the United States as a base, he was conspiring to incite a revolution against a friendly country (that is, Mexico). Released on bond, he was again arrested at El Paso, Texas, July 3rd. At that time he appeared to be preparing to cross into Mexico. Various stories had been circulated about the support he had been able to secure, and it was asserted by Federal agents that this backing was German, chiefly represented by a certain Franz Rintelen, who was believed to have expended large sums to stir up trouble in Huerta's interest, and who eventually became a prisoner in the Tower of London. These charges were not proved, but for most of the time until his death Huerta was kept under guard at Fort Bliss. It was only when the disease of which he died (sclerosis of the liver) had made such progress that physicians ordered his removal, that he was taken to his home in El Paso. He was to have been tried Jan. 10, 1916.

A body of legend, or gossip, grew up about Victoriano Huerta. It seems certain that he was reckoned a hard drinker even in a country where hard drinking is common, and that his manner of life in general was such as to eventually ruin the iron constitution he possessed. But, as far as public appearance went, he was said to wear always the same cold, hard, calculating, inscrutable expression. His was a will that balked at nothing short of the end desired; until he was hemmed in on all sides he held his own with fierce tenacity, and even after he had been overcome he was ready to try it again.

**HUGHES, CHARLES EVANS.** See UNITED STATES, *Presidential Campaign*.

**HUGHES, MATTHEW S.** See METHODIST EPISCOPAL CHURCH.

**HUGHES, SIR SAM.** See CANADA.

**HUGHES, WILLIAM MORRIS.** An Australian statesman, who gained great prominence in 1916 through his speeches, made in Great Britain, on the subject of the Empire and its relation to the European war. He was born in Wales in 1864, and was educated at Llandudno Grammar School and at St. Stephen's Church of England School, Westminster, where he taught for a time. In 1885 he went to Australia, where within 30 years he had risen from humble employment to be Prime Minister. Mr. Hughes first gained public attention by his work in behalf of organized labor. It was on the Labor party's platform that, in 1894, after four terms in the Parliament of New South Wales, he was elected to the first Federal Parliament, as representative for a division of Sydney. After his admission to the bar, he had devoted himself to the organization of Maritime Unions, becoming general secretary of the Wharf Laborers, president of the Carters' Union of New South Wales, and president of the

Waterside Workers' Federation. In the government, he was chosen to the post of Minister of External Affairs in 1904, was Attorney-General after 1908, and became Prime Minister in 1914. While in Britain in 1916, Mr. Hughes made more than 100 speeches, direct, energetic, and popular in character, to urge united resistance by the Empire against Germany, not only by fighting, but by trade war. An enemy of the laissez-faire and free-trade theories, he demanded protection for British industry and for all labor. While he met opposition to his views, a considerable part of the press and the populace, besides all sorts of official and semi-official bodies, welcomed him with extraordinary enthusiasm. It was at the invitation of the government that he came to England to confer on war matters, but it was virtually a public demand that led to his appointment as British delegate to the commercial conference of the Entente Powers, held in Paris. A believer in compulsory military service, he made this a plank in the Australian Labor party's platform as early as 1901.

**HUNGARY.** A European kingdom, forming a part of the Austro-Hungarian monarchy. The Hungarian kingdom consists of "Hungary proper" and Croatia and Slavonia. Sometimes Transylvania, on account of its very large Rumanian population, is not regarded as a part of Hungary proper. See AUSTRIA-HUNGARY.

**HYDROAEROPLANE.** See AERONAUTICS.

**HYDRO-ELECTRIC POWER.** See ELECTRIC POWER, TRANSMISSION OF.

**HYDROPHOBIA.** See RABIES.

**HYGIENE.** The bubble fountain, which has largely replaced other forms of common drinking appliances, has been discovered to be not without possible dangers, especially if the flow of water is not forcible enough to keep all parts of the metal covered. An epidemic of streptococcus tonsillitis in one of the dormitories of a large university was traced finally to the bubble fountain used there. It was found that the water pressure was so low that it was almost impossible to drink from the bubble without bringing the lips into contact with the metal. The fountains were found on examination to be heavily contaminated with streptococci. The city water was pure, but the contagious organisms were obtained from the surface of the fountain, from the inside of it, and from the water discharged through it. Later laboratory investigations demonstrated that streptococci were being discharged in over half the fountains, the contents varying in amount from a few bacteria to an almost pure culture, the latter being obtained by swabbings from the surface of the fountain. It appears that bacteria may remain in the water from 2 to 135 minutes, depending partly on the height of the bubble. The explanation is that while most of the organisms are swept away, many remain dancing in the column of water just as a ball dances on the garden fountain. To remedy this difficulty, it was found necessary only to slant the tube at an angle of 50 degrees from the vertical.

**ICELAND.** A Danish crown colony, with an area of about 40,456 square miles, of which 16,245 square miles are inhabited; population (1911), 85,183. The responsible executive resides at Reykjavik. The trade in 1912 amounted to 15,347,000 kroner imports, and 16,568,000 kroner exports, the latter consisting of wool, dried fish, mutton, ponies, and sheep. A Brit-

ish source gives imports from Denmark for 1914 at £301,333; exports to Denmark, £555,944. The legislature (Althing) has 40 members, 34 elective by universal suffrage. The franchise is exercised by men and women over 25 years of age. The year 1916 has been full of disturbing influences for the Icelanders. Owing to the war, business has been entirely deranged and largely suspended, as shipments to and from Europe were made with extreme difficulty and danger. In this extremity attempts were made to trade direct with America. Three commissioners brought direct to the United States a cargo of wool and herring,—possibly the first shipment thus made,—and obtained a return cargo for Icelandic needs. This was followed by two private ships, of the Iceland Navigation Co. However, fisheries flourished, and prices rose. Much progress was made in the development of coal veins, which improved steadily in quality. In eastern Iceland a *spath* or iceland-spar mine was worked under French auspices. The introduction of automobiles suited to pony-trails promises a revolution in local travel and transportation.

**IDAHO. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 436,881. The population in 1910 was 325,594.

**AGRICULTURE.** The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture in 1915-16, were as follows:

	Acreage	Prod. Bu.	Value
Corn .....	1916 21,000	735,000	\$735,000
	1915 22,000	770,000	500,000
Wheat .....	1916 634,000	15,071,000	22,004,000
	1915 670,000	18,730,000	14,984,000
Oats .....	1916 310,000	18,330,000	7,198,000
	1915 385,000	15,745,000	5,353,000
Potatoes .....	1916 27,000	4,050,000	5,144,000
	1915 28,000	3,500,000	1,960,000
Hay .....	1916 725,000	1,812,000	21,925,000
	1915 677,000	1,828,000	14,076,000
Rye .....	1916 2,000	34,000	32,000
	1915 3,000	60,000	41,000
Barley .....	1916 190,000	7,410,000	6,076,000
	1915 191,000	7,736,000	4,023,000

a Tons.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments....	725	698
Average number of wage earners	8,220	8,919
Capital invested .....	\$32,477,000	\$44,961,000
Wages .....	5,498,000	7,491,000
The value of materials used...	9,920,000	14,892,000
The value of products.....	22,400,000	28,454,000

**MINERAL PRODUCTION.** The output of gold, silver, copper, lead, and zinc in the State in 1915 was \$33,328,930, an increase of over 50 per cent compared with the production in 1914. The gold production remained nearly the same. Silver increased about 4 per cent in quantity, copper increased from 6,445,187 pounds in 1914 to 6,978,713 pounds in 1915. The great increase in the total value of the metal output amounted to more than \$13,000,000, which was due largely to the increased price of lead and zinc. The production of lead was 345,999,466 pounds, an

increase of 8 per cent. The production of zinc was 70,152,234 pounds, valued at \$8,699,001.

The value of the mined output of gold, silver, copper, lead, and zinc in the State in 1916, according to the estimates of the United States Geological Survey, was over \$47,000,000, an increase of 41 per cent from \$33,328,930 in 1915. There was a record output of silver, lead, and zinc, and increased production of copper, and a slight decrease in gold. The mined production of gold decreased from \$1,179,731 in 1915 to \$1,098,000 in 1916, a decrease of 7 per cent. Part of the decrease was due to the smaller placer output in dredging. The mined output of silver increased from 11,769,128 ounces in 1915 to approximately 12,500,000 ounces in 1916. As the price of silver was much above that of 1915 the value of the output increased from \$5,966,948 to \$8,225,000, or 38 per cent. The production of copper increased from 6,978,713 pounds in 1915 to over 8,000,000 pounds in 1916. The increase in value was from \$1,231,275 to \$2,184,000, or 79 per cent. The mined output of lead increased from 345,999,466 pounds in 1915 to 362,000,000 pounds in 1916. The value increased from \$16,261,975 to \$24,616,000, or about 51 per cent. The mined production of zinc increased from 70,152,234 pounds in 1915 to approximately 80,000,000 pounds in 1916, while the value increased from \$8,699,001 to about \$10,060,000, or 25 per cent.

**EDUCATION.** Statistics for 1915 are the latest available. In that year there were 120,000 pupils in the public schools. The enrollment was 92,437. There were 2943 teachers, of whom 2276 were women, and 667 men. The average salary of women teachers was \$72.55 per month, and of men \$95.25. The total expenditure for educational purposes is about \$4,500,000 annually.

**FINANCE.** The total receipts for the fiscal year 1915 were \$3,054,903, and the disbursements, \$3,172,250. At the beginning of the year there was a balance of \$246,350, and at the end, of \$1,132,047. The bonded debt of the State in that year amounted to \$2,237,750.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions of the State include a Soldiers' Home at Boise, State Penitentiary at Boise, Insane Asylums at Black Foot and Orofino, and a State Sanitarium at Nampa.

**POLITICS AND GOVERNMENT.** There was little of unusual interest in the political history of the State during the year. The Legislature did not meet. Aside from the voting for President the only elections in the State were for State officers, and two Congressmen-at-large. The Democrats elected the State ticket by a plurality of only 572 votes. Alexander, the Democratic candidate, received 63,877; Davis, Republican, 63,305. The Socialist candidate, Triplow, received 7321 votes. For President, Wilson received 70,021 votes, Hughes, 56,368. In 1912 Wilson received 33,921 votes, Taft, 32,810, Roosevelt, 25,527. The Republicans elected the two representatives in Congress by a considerable majority. All the State officers except the treasurer and State superintendent of instruction are Democratic.

During the year work was begun on a new irrigation system and parallel electric railroad leading from Boise into hitherto undeveloped territory known as the Bruneau country. This system, which is under the Carey Act, will re-

claim about 75,000 acres of land. One of the provisions of the contract is that no land is to be sold by the promoting company until water is running in the canals. The railroad, which will connect this territory with Boise, will pass through the Grand View project also, and will connect with the Oregon Short Line Railroad at Orchard.

**STATE OFFICERS.** The State officers for 1917 were as follows: Governor, Moses Alexander; Lieutenant-Governor, Ernest L. Parker; Secretary of State, William T. Dougherty; State Treasurer, John W. Eagleston; State Auditor, Clarence Van Dusen; Attorney-General, T. A. Walters; Superintendent of Public Instruction, Ethel E. Redfield; Inspector of Mines, Robert Bell.

**JUDICIARY.** Supreme Court: Chief Justice, William M. Morgan; Associate Justices, Alfred Budge and John C. Rice; Clerk, I. W. Hart.

**STATE LEGISLATURE:**

	Senate	House	Joint Ballot
Democrats .....	21	36	57
Republicans .....	16	29	45
Democratic majority ..	5	7	12

**IDAHO, UNIVERSITY OF.** A State co-educational institution at Moscow, Idaho, founded in 1889. In the fall of 1916 there were 91 regular instructors and 23 extension workers. The student enrollment was 909. Prof. A. P. R. Drucker was appointed head of a new department of commerce. Separate departments were established for plant physiology and entomology. During the year correspondence courses were begun on a large scale. The finances of the institution are on a biennial basis which in 1916-17 provided productive funds amounting to \$666,346 and an income of \$264,803. The library contains 40,000 volumes. The president of the University of Idaho is Melvin A. Brannon.

**ILLINGWORTH, ALBERT.** See GREAT BRITAIN, *Government.*

**ILLINOIS. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 6,193,826. The population in 1910 was 5,638,591.

**AGRICULTURE.** The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture in 1915-16, were as follows:

	Acreage	Prod. Bu.	Value
Corn .....1916	10,400,000	806,800,000	\$257,712,000
1915	10,400,000	874,400,000	202,176,000
Wheat .....1916	1,475,000	16,225,000	26,771,000
1915	2,800,000	53,200,000	53,200,000
Oats .....1916	4,470,000	172,095,000	87,768,000
1915	4,343,000	195,435,000	68,402,000
Potatoes ..1916	125,000	7,250,000	12,978,000
1915	126,000	13,860,000	8,177,000
Hay .....1916	3,100,000	4,495,000	50,794,000
1915	2,500,000	a 3,850,000	41,580,000
Tobacco ...1916	700	525,000	52,000
1915	700	b 595,000	54,000
Rye .....1916	43,000	666,000	813,000
1915	49,000	906,000	752,000
Barley ....1916	60,000	1,920,000	1,978,000
1915	54,000	1,836,000	1,047,000

a Tons. b Pounds.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States

are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments	18,026	18,888
Average number of wage earners .....	465,764	506,948
Capital invested .....	\$1,548,171,000	\$1,943,836,000
Wages .....	273,319,000	340,910,000
The value of materials used .....	1,160,927,000	1,340,184,000
The value of products ..	1,919,277,000	2,247,323,000

**MINERAL PRODUCTION.** The petroleum marketed in 1915 from the oil fields of the State was 19,041,695 barrels, which was about 13 per cent less than the corresponding output of 1914. The average price received for this oil was 80 cents a barrel. The total amount of the value was \$18,655,850, a decrease of \$6,770,329, compared with 1914. As a consequence of this decline in output Illinois fell to fourth place in the rank of oil producing States, third place being taken in 1915 by Texas. During the year a total of 757 wells were completed, compared with 1579 in 1914.

There were mined during the year 1915, silver, lead, and zinc valued at \$1,464,067, compared with a value of \$547,816 in 1914. There were mined 1320 short tons of lead concentrates, and 20,454 short tons of zinc concentrates. The silver produced in 1915 amounted to 3864 fine ounces.

The coal production of the State in 1916 is estimated at 64,500,000 tons, an increase of more than 5,600,000, or nearly 10 per cent over the production of 1915. That the output was not even greater than this is attributed to a lack of cars, and in some localities to a scarcity of labor. The production was above the normal during the first three months of the year, but fell until the middle of August, when it continued to increase. The most notable feature of the year was the extension of the markets for Illinois coal, but this is probably only temporary.

**TRANSPORTATION.** The total railway mileage in the State on June 30, 1915, was 12,392. The roads having the longest mileage were the Illinois Central, 2024; the Cleveland, Cincinnati, Chicago, and St. Louis, 650; the Wabash, 669; the Gan Dalia Railroad, 303; and the Elgin, Joliet, and Eastern, 327.

**EDUCATION.** The latest figures available for education in the State are those for 1914. In that year the total school population was 1,650,258. The total enrollment in the schools was 1,043,227. The total number of teachers employed was 31,805, of whom 26,035 were women, and 5770 men. The amount paid to teachers was \$21,781,221, and the average yearly salary of teachers was \$684.83. The total school expenses for the year were \$40,287,756. The value of school property was \$119,568,943. There was appropriated by the State for educational purposes \$3,000,000, and there was raised by district taxation \$32,962,153.

**FINANCE.** The total receipts from all sources for the biennial period Oct. 1, 1914, to Sept. 30, 1916, amounted to \$52,740,171. The disbursements were \$44,944,340. There was a balance on Oct. 1, 1914, of \$12,255,132, and on Oct. 1, 1916, of \$7,795,830.

**CHARITIES AND CORRECTIONS.** The State charitable and correctional institutions are as fol-

lows: The Elgin State Hospital at Elgin, the Kankakee State Hospital at Kankakee, the Jacksonville State Hospital at Jacksonville, the Anna State Hospital at Anna, the Watertown State Hospital at Watertown, the Peoria State Hospital at Peoria, the Chester State Hospital at Chester, Chicago State Hospital, the Lincoln State School and Colony at Lincoln, Dixon State School and Colony at Dixon, the Illinois School for the Deaf at Jacksonville, the Illinois School for the Blind at Jacksonville, the Illinois Industrial Home for the Blind at Chicago, the Illinois Soldiers' and Sailors' Home at Quincy, the Soldiers' Widows' Home of Illinois at Wilmington, the Illinois Soldiers' Orphans' Home at Normal, the Illinois Charitable Eye and Ear Infirmary at Chicago, the State Training School for Girls at Geneva, the St. Charles School for Boys, and the Alton State Hospital at Alton.

The total population of these institutions in November, 1916, was 22,821. They are administered by the State Charities Commission. The total appropriation for the care of these institutions covering the years 1916-17 was \$10,736,282. In addition the Legislature appropriated certain sums for new institutions in new buildings. Among these was the appropriation for the erection of a new State colony for epileptics, and an appropriation for the continuation of the erection of the Alton State Hospital. During 1915-16 the mechanical restraint of patients in the State hospitals was entirely abolished, and corporal punishment in institutions housing children was absolutely prohibited. Employees of all these institutions were placed on an eight hour day with one day's rest in seven, and an automatic wage increase scale was formulated.

**POLITICS AND GOVERNMENT.** The Republican organization of Illinois passed under new control in 1916. The presidential primaries of April 11th involved struggles for dominance between the factions. Senator L. Y. Sherman, a "favorite son" entry, was the only Republican candidate who filed for the preferential ballot. He received 155,945 votes. Roosevelt's name was written in by 15,348; Hughes's was written in by 1078. In the Democratic primaries, President Wilson received 136,839 votes.

The Illinois law provides for the direct election of national delegates and in addition party committeemen were elected at the April primaries. Senator Sherman had a "favorite son" slate of delegates. It was smashed by Charles H. Sergel and John Siman, former Progressives who were out for Roosevelt, and by Andrew Russel. John M. Harlan ran for delegate-at-large, using Roosevelt as his platform and preparedness as his argument. He failed of election by 23,000 votes, although he got 113,716 votes. William B. McKinley, Taft manager in 1912, ran highest for delegate-at-large (eight elected, with 148,595 votes, and Medill McCormick, a Roosevelt manager in 1912, ran second with 147,641. Thus, with three exceptions, the Illinois delegation to the national convention was pledged to Sherman.

On the Democratic side, the Roger C. Sullivan forces controlled the Illinois delegation to the St. Louis convention. Robert M. Sweitzer, defeated candidate for mayor of Chicago in 1915, ran as high man with 118,919 votes; Governor Dunne second with 112,536. Carter H. Harri-

son, former mayor of Chicago, was among the winning eight for delegate-at-large, and for the first time in many years had a seat in a Democratic national convention, not in the gallery. Robert E. Burke, who cast the only vote against Wilson at St. Louis, was among the delegates-at-large.

In the fight over ward committeemen in Chicago, the notable feature was the defeat of Charles S. Deneen, former Governor, Republican, who was ousted by the forces of Mayor William Hale Thompson from a ward committee-ship he had held for 22 years.

When the Republican convention met at Peoria April 21st a new alliance was formed. The Thompson, Sherman, and Lowden groups combined and elected Fred E. Sterling as State chairman. It overthrew the Deneen camp, which had dominated the State organization since 1904, and it was the greatest shake-up in the Republican machine in 12 years. Behind the combination was a political deal involving the national committee-ship and likewise a tentative understanding on a State slate for the September primaries. Mayor Thompson was the candidate of the new alliance for national committeeman. Roy O. West, the old committeeman, was the choice of the Deneen forces. At the national convention, Thompson won, getting 38 votes to West's 17. After much skirmishing the Cook County committee was reorganized. Here, too, the Deneen forces lost control. Homer K. Galpin was elected county chairman through a combination of city hall men and "neutrals." Thus, through the April 11th primaries the Deneen group lost county and State control and likewise the national committee-ship.

On the Democratic end the Sullivan forces increased their margin of control over both the State and county machinery.

**State Primaries.** Three Republicans ran for Governor. Col. Frank O. Lowden had the support of the Sherman and Thompson camps in addition to his personal following. Col. Frank L. Smith of Dwight made a remarkable race without the backing of any of the factional organizations. The Deneen camp brought out Morton D. Hull, a State senator. At the primaries September 13th, Colonel Lowden won by a majority vote. Back of the fight over the State offices was a bitter struggle over the Cook County offices, and here the Deneen group managed to get a few places, important in a patronage way—the recorder of deeds and member of the board of review. On these two offices and the jobs they command, the Deneen camp is basing a struggle to come back.

On the Democratic end Governor Dunne was up for re-nomination. He had stirred the wrath of the Sullivan men by refusing to enter the caucus of the Illinois delegates at St. Louis where Sullivan was given a bouquet endorsement for Vice-President. The Sullivan group, however, brought out no candidate until a few days before the primaries, when the Harrison-Dunne forces put forth a circular attacking some of the Sullivan leaders. At once the Cook County committee met and indorsed William B. Brinton of Dixon, a plow maker, against Dunne. The Governor, however, won by a large margin at the polls.

**The Fall Campaign.** The Republican campaign was started off with a State convention

at Peoria at which Hughes was the central figure. The State platform declared for a long list of reforms, among them: adoption of the tax amendment to the constitution; revision of the revenue laws; consolidation of State boards and departments to prevent overlapping and waste; a budget; a corrupt practice act; revision of elections to curtail frequency and expense; a constitutional convention; home rule for Chicago on public utilities; shorter hours for women workers; State supervision of private banks; full suffrage for women and extension of civil service. It emphasized "Democratic extravagance."

The Democrats a week later adopted a State platform charging the corporate interests with trying to get possession of the State government at Springfield. It called for a corrupt practices act; a living wage for Pullman porters (Colonel Lowden was a director of the Pullman company); an eight-hour day for all workers outside agricultural pursuits; short ballot; initiative and referendum; private bank supervision; home rule for Chicago; constitutional convention; a budget and revenue revision and other questions which were outside the range of partisan issues. As a bid for the feminine vote of Illinois, the Democrats named Mrs. Catherine Waugh McCulloch of Evanston, a woman suffrage leader, for one of the presidential electors-at-large.

Up to within two weeks of election day, November 7th, Illinois was debatable territory on President. The election of the Republican State ticket was a foregone conclusion, but Wilson was displaying great strength. The attitude of the women voters, who for the first time had the ballot on presidential electors, was the main problem. Republican workers in all quarters reported Hughes and Fairbanks to be lagging. The State candidates, off on a special train tour of the State, subordinated their own candidacies and whooped it up for Hughes and laid all stress on the national aspects of the election. At length, some two weeks before election day, State headquarters, which had been gloomy, detected a strong swing towards Hughes. Roosevelt made a speech at the Chicago stockyards which was a call to the former Progressives. It had wide effect, Chicago and Illinois being a main stamping ground of the Moose in 1912. The presence of former Progressives on the tickets, chief among them Medill McCormick, also brought the two wings together. Especial attention was paid to organizing the women, and when the vote was counted, Illinois, normally Republican by between 150,000 and 200,000 votes, led all the States in the size of its Republican vote and its Republican plurality.

The vote stood: For President, Wilson, 950,229; Hughes, 152,549; Benson, 61,294; Hanly, 26,047; Reimer, 2488. For Governor, Lowden, Republican, 696,535; Dunne, Democrat, 556,654; Steadman, Socialist, 52,316; Golden, Prohibition, 15,309; Frances, Socialist Labor, 1739.

The vote of men and women for President was divided as follows: for Wilson 556,937 men, 383,292 women; for Hughes 693,334 men, 459,215 women. In 1908 Taft had a plurality of 179,000, and Roosevelt in 1904 had a plurality of 305,000. In these elections the women had no vote. The Illinois delegation in Congress stands

21 Republicans and 6 Democrats, as compared with 17 Republicans and 10 Democrats in the previous Congress.

**OTHER EVENTS.** By a decision of the State Supreme Court handed down on February 16th, the women of the State were denied the right to vote for delegates and alternates in national nominating conventions and State central and precinct committeemen. The decision held that while the Legislature had the right to give women this kind of suffrage it had not done so, and it was not within the province of the court to write the privilege into the law.

Plans for the new passenger terminal of the Illinois Central Railroad in Chicago were completed during the year. These called for a steel and granite structure 700 by 400 feet, with a front of columns of great size and beauty, and with train sheds 1400 feet long. The total expenditure for the station may reach \$20,000,000.

On October 23rd, Charles C. Healey, chief of police of Chicago, was indicted on two charges, the first indictment accused him of malfeasance in office, and the second named him with two others as conspirators in a plot to nullify the anti-gambling law.

**STATE OFFICERS.** Governor, Frank O. Lowden; Lieutenant-Governor, John G. Oglesby; Secretary of State, Louis L. Emmerson; Treasurer, Len. Small; Auditor, Andrew Russel; Adjutant-General, Frank S. Dickson; Attorney-General, Edward J. Brundage; Superintendent of Education, Francis G. Blair; Secretary of Agriculture, B. M. Davison; Superintendent of Insurance, Rufus M. Potts—all Republicans except Potts, Democrat.

**JUDICIARY.** Supreme Court: Chief Justice, Charles C. Craig; Associate Justices, James H. Cartwright, William M. Farmer, Orrin N. Carter, Frank H. Dunn, George A. Cook, Warren W. Duncan; Clerk, Charles W. Vail.

#### STATE LEGISLATURE:

	Senate	House	Joint Ballot
Republicans .....	25	78	103
Democrats .....	25	70	95
Progressives .....	1	2	3
Socialists .....	..	2	2
Majority .....	..	4 R	3 R

**ILLINOIS UNIVERSITY OF.** A co-educational non-sectarian institution at Urbana, Ill. It was founded in 1867. On Nov. 1, 1916, the total enrollment in all departments of the university was 5876 and the faculty numbered 840. The following important additions to the faculty were made: Henry Winthrop Ballantine (from the University of Wisconsin), professor of law and dean of the College of Law; Ernest Bernbaum (from Harvard), professor of English; Eliot Blackwelder (from the University of Wisconsin), professor of geology; Fanny C. Gates (from Grinnell College), dean of women; Barry Gilbert (from the University of California), professor of law; Cullen Warner Parmelee (from Rutgers College), professor of ceramic engineering; Richard Chace Tolman (from the University of California), professor of chemistry. For the year ending June 30, 1916, the University of Illinois received a total income of \$3,051,875, of which \$2,453,370 was received from State appropriations and \$148,732 from the Federal government. The library contained, on October 1st, 374,167

volumes and 92,430 pamphlets. President, Edmund Janes James. See the article HORTICULTURE.

**ILLUMINATION.** See ELECTRIC LIGHTING.  
**IMMIGRATION AND EMIGRATION.**  
 In the matter of immigration the year 1916 duplicates to a very great extent the year 1915. The number of aliens entering the United States varied only in a slight degree. During the fiscal year 298,826 aliens entered the country, compared with 326,700 in 1915. How immigra-

The increase in the percentage of rejection is due to two circumstances: first, a poorer class of immigrants, second, the opportunity afforded at some of the seaports for a more thorough examination than was possible when a larger number of applicants had to be inspected within a given time.

The following table shows the number of immigrant aliens admitted during the fiscal year, by countries of the last permanent residence and races of people.

## IMMIGRATION AND EMIGRATION

Net Increase or Decrease of Population by Arrival and Departure of Aliens, Fiscal Year Ended June 30, 1916, by Races or Peoples.

Race or people	Admitted.			Departed.			Increase (+) or decrease (-)
	Immigrant aliens	Nonimmigrant aliens	Total	Emigrant aliens	Nonimmigrant aliens	Total	
African (black)	4,576	2,474	7,050	1,684	1,570	3,254	+ 3,796
Armenian	964	116	1,080	659	52	711	+ 369
Bohemian and Moravian (Czech)	642	55	697	42	37	79	+ 618
Bulgarian, Serbian, and Montenegrin	3,146	265	3,411	290	329	619	+ 2,792
Chinese	2,239	1,022	3,261	2,148	2,002	4,150	- 889
Croatian and Slavonian	791	89	880	76	65	141	+ 689
Cuban	3,442	4,266	7,708	1,454	5,899	7,353	+ 355
Dalmatian, Bosnian, and Herzegovinian	114	9	123	4	6	10	+ 113
Dutch and Flemish	6,443	1,279	7,722	742	2,137	2,879	+ 4,843
East Indian	80	48	128	91	100	191	+ 63
English	36,168	14,782	50,950	7,826	35,483	43,309	+ 7,641
Finnish	5,649	487	6,136	543	707	1,250	+ 4,886
French	19,518	2,697	22,215	2,297	3,383	5,680	+ 16,535
German	11,575	1,954	13,509	873	1,989	2,862	+ 10,647
Greek	26,792	863	27,655	4,855	1,360	6,215	+ 21,440
Hebrew	15,108	643	15,751	199	515	714	+ 15,037
Irish	20,636	2,697	23,333	1,851	4,080	5,931	+ 17,402
Italian (north)	4,905	820	5,725	4,020	1,507	5,527	+ 198
Italian (south)	33,909	2,561	36,470	68,981	11,904	80,885	- 44,415
Japanese	8,711	3,996	12,707	780	8,638	9,418	+ 3,289
Korean	154	7	161	29	19	48	+ 113
Lithuanian	599	19	618	28	7	35	+ 583
Magyar	981	78	1,059	394	92	486	+ 573
Mexican	17,198	7,963	25,161	559	2,317	2,876	+ 22,285
Pacific Islander	5	13	18	3	54	57	+ 39
Polish	4,502	162	4,664	358	139	497	+ 4,167
Portuguese	12,208	700	12,908	2,185	1,353	3,538	+ 9,370
Rumanian	953	49	1,002	138	52	190	+ 812
Russian	4,858	443	5,301	4,716	1,380	6,096	- 795
Ruthenian (Rusniak)	1,365	36	1,401	17	32	49	+ 1,352
Scandinavian (Norwegians, Danes, and Swedes)	19,172	5,259	24,431	3,954	8,956	12,910	+ 11,521
Scotch	13,515	3,634	17,149	2,096	6,092	8,188	+ 8,961
Slovak	577	20	597	74	33	107	+ 490
Spanish	9,259	3,991	13,250	2,792	3,629	6,421	+ 6,829
Spanish American	1,881	2,248	4,129	516	2,431	2,947	+ 1,182
Syrian	676	328	1,004	120	293	413	+ 591
Turkish	216	59	275	41	94	135	+ 140
Welsh	983	252	1,235	214	341	555	+ 680
West Indian (except Cuban)	948	1,426	2,374	603	1,736	2,339	+ 35
Other peoples	3,888	162	3,550	769	229	998	+ 2,552
Not specified*	.....	.....	.....	10,744	.....	10,744	- 10,744
Total	298,826	67,922	366,748	129,765	111,042	240,807	+125,941
Admitted in and departed from Philippine Islands	4,122	7,374	11,496	850	9,051	9,901	+ 1,595

\* Departed via Canadian border. Reported by Canadian Government as Canadians.

tion has been affected by the war in Europe may be noted from the fact that during the fiscal year 1914 aliens to the number of 1,218,480 migrated to the United States. In addition to the number of immigrant aliens entering in 1916 67,922 non-immigrant aliens entered, so that the total admissions were 366,748. Against this 129,765 emigrants and 111,042 non-emigrant aliens, a total of 240,807 left the United States. The actual increase in population through immigration was 125,941. The increase in 1915 was 50,070, while in 1914 it was 769,276. In 1914 aliens to the number of 3041 were rejected, a percentage of 2.3 of the number who applied. The corresponding figures of percentage in 1915 were 21.111 and 5.3 per cent, and for 1916, 18,867 and 4.9 per cent.

The Burnett Immigration Bill with the literacy test passed the House of Representatives in April by a vote of 308 to 87. The literacy test excludes all aliens over 16 years of age, physically capable of reading, who cannot read the English language, or any other language, including Hebrew or Yiddish, providing that any admissible alien or any alien heretofore or hereafter admitted or any citizen of the United States may bring in or send for his father, or grandfather, over 55 years of age, wife, mother, grandmother, or his unmarried or widowed daughter, if otherwise admissible whether such relatives can read or write, and such relatives will be permitted to enter. In the classification already excluded, the bill added stowaways, vagrants, sufferers from tu-

berculosis, those who advocate the lawful destruction of life, Hindus and "persons of constitutional psychopathic inferiority." The head tax was increased from \$4 to \$8, and the penalties imposed on steamship companies for bringing defectives were made heavier than heretofore. No action was taken on the bill by the Senate in 1916.

**IMPERIAL VALLEY IRRIGATION SYSTEM.** See IRRIGATION.

**IMPORTS.** See FINANCIAL REVIEW

**INCANDESCENT LAMPS.** See ELECTRIC LIGHTING.

**INCINERATORS.** See GARBAGE AND REFUSE DISPOSAL.

**INCOME TAX.** See TAXATION.

**INDIA, BRITISH.** British India is that part of East India administered by the British sovereign (as Emperor of India) through the Governor-General of India in council. India, as defined by the British Parliament, includes British India and the native states that are under the suzerainty of the British government. The capital of British India was formerly Calcutta, but since 1912 has been Delhi.

**AREA AND POPULATION.** The combined area of British India and the native states under British suzerainty, as covered by the census of 1911, is stated at 1,802,657 square miles and the number of inhabitants at 315,156,396. British territory is divided into 15 provincial governments, which have a total area of 1,093,074 square miles; the native states have an aggregate area of 709,583 square miles. Inter-provincial transfers of territory, and transfers from native to British territory, and vice versa, occasionally take place, so that censuses as originally reported are subject to adjustment. Nearly a year after the last census, that is, on April 1, 1912, the Province of Eastern Bengal and Assam and the Province of Bengal were reconstituted and erected into three provinces. These provinces are Bengal (which received the style "presidency"), Bihar and Orissa, and Assam. On Oct. 1, 1912, another new province was erected out of the division of Delhi in the Punjab. The table below shows the area of British India by provinces and of the native states, together with the population as returned by or adjusted from the census of March 10, 1911; the table also shows the percentage of increase (+) or decrease (-) in the number of inhabitants from 1901 to 1911 and from 1981 to 1901.

Provinces	Square miles	Population 1911	Increase or decrease per cent	
			1901-11	1891-1901
North-West Frontier Province	13,418	2,196,938	+7.6	+9.9
Punjab (incl. Delhi Province) †	99,779	19,974,956	-1.7	+6.8
United Provs. of Agra and Oudh	107,267	47,182,044	-1.1	+1.7
Agra †	83,109	3,624,040	-0.7	+1.8
Oudh †	24,158	12,558,004	-2.1	+1.4
British India	1,093,074	244,267,542	+5.5	+4.7
<b>Native States and Agencies</b>				
Assam States (Manipur) ..	8,456	346,222	+21.7	.....
Baluchistan States	80,410	420,291	-1.9	.....
Baroda State	8,182	2,032,798	+4.1	-19.2
Bengal States	5,398	822,565	+11.3	+8.3
Bihar and Orissa States	28,648	3,945,209	+19.0	+9.5
Bombay States	68,864	7,411,675	+7.3	-14.5
Central India Agency	77,867	9,356,980	+10.1	-16.2
Central Provs. States	31,174	2,117,002	+29.8	-4.8
Hyderabad State	82,698	13,374,676	+20.0	-8.4
Kashmir State	84,432	3,158,126	+8.7	+14.2
Madras State	10,549	4,811,841	+14.9	+13.2
Mysore State	29,475	5,806,198	+4.8	+12.1
N.W. Frontier Provs. (agencies etc.)	25,500	1,622,094	.....	.....
Punjab States	86,551	4,212,794	-4.8	+3.8
Rajputana Agency	128,987	10,530,482	+6.9	-19.0
Sikkim State	2,818	87,920	+49.0	+93.8
United Provs. States	5,079	832,036	+8.7	+1.2
Native States	709,583	70,888,854	+18.0	-5.0
Total India	1,802,657	315,156,396	+7.1	+2.5

\* Included in Bihar and Orissa Province. † Included in Bombay Presidency. ‡ Included in Central Provinces and Berar. § The area of Delhi Province has been provisionally stated at 557 square miles, and its 1911 population at 391,828. ¶ Included in the United Provinces.

In 1911, males and females in British India and the native states numbered 161,338,935 and 153,817,461 respectively; in British India alone, 124,873,691 and 119,393,851. The urban population was returned at 29,748,228 and the rural at 285,408,168.

The number of languages spoken in India, as shown by the 1911 census, is 264. The languages of greatest prevalence are as follows: Hindi, the vernacular of 82,003,235 persons in 1911; Bengali, 48,367,915; Telugu, 23,542,861; Marathi, 19,806,636; Tamil, 18,128,365; Rajasthan, 14,067,590; Western Hindi, 14,037,832; Gujarathi, 10,682,248; Kanarese, 10,525,739; Oriya, 10,162,321; Burmese, 7,803,504; Malayalam, 6,792,277. Further details of the population by language are given in the 1915 YEAR BOOK.

The population of the larger cities (including cantonments) in 1911 and the increase (+) or decrease (-) per cent since 1901 are as follows: Calcutta, with suburbs, 1,043,307 (+ 9.9); Bombay, 979,445 (+ 26.2); Madras, 518,660 (+ 1.8); Hyderabad, 500,623 (+ 11.6); Rangoon, 293,316 (+ 19.5); Lucknow, 259,798 (- 1.6); Delhi, 232,837 (+ 11.6); Lahore, 228,687 (+ 12.7); Ahmedabad, 216,777 (+ 16.6); Benares, 203,804 (- 4.4); Agra, 185,449 (- 1.4); Howrah, 179,006 (+ 13.6); Cawnpore, 178,557 (- 12.0); Allahabad, 171,697 (- 0.2); Poona, 158,856 (+ 3.6); Amritsar, 152,756 (- 6.0); Karachi, 151,903 (+ 30.2); Mandalay, 138,299 (- 24.8); Jaipur, 137,098 (- 14.4); Patna, 136,153 (+ 1.0); Madura,

Provinces	Square miles	Population 1911	Increase or decrease per cent	
			1901-11	1891-1901
Ajmer-Merwara ..	2,711	501,895	+5.1	-12.1
Andamans and Nicobars	3,143	26,459	+7.3	+57.9
Assam	53,015	6,713,635	+14.9	+6.7
Baluchistan	54,228	414,412	+8.5	.....
Bengal	78,699	45,483,077	+7.9	+7.8
Bihar and Orissa	83,191	34,490,084	+3.8	+1.1
Bihar *	42,361	23,752,969	+1.7	-0.9
Orissa *	13,743	5,181,753	+3.0	+6.8
Chota Nagpur *	27,027	5,605,862	+14.4	+5.9
Bombay (Pres.)	123,059	19,872,642	+6.0	-1.7
Bombay †	75,998	16,113,042	+5.3	-4.1
Sind †	46,986	3,513,435	+9.4	+11.7
Aden †	80	46,165	+5.0	-0.2
Burma	280,839	12,115,217	+15.5	+35.9
Central Provinces and Berar	99,823	18,916,808	+16.2	-8.3
Central Provs. ‡	82,057	10,859,146	+17.8	-9.2
Berar ‡	17,760	3,057,162	+11.0	-5.0
Coorg	1,582	174,976	-3.1	+4.4
Madras	142,330	41,405,404	+8.3	+7.3



134,130 (+26.6); Bareilly, 129,462 (-2.8); Srinagar, 126,344 (+3.0); Trichinopoly, 123,512 (+17.9); Meerut, 116,227 (-1.6); Surat, 114,868 (-3.7); Dacca, 108,551 (+21.0); Nagpur, 101,415 (-20.6); Bangalore, 100,834 (+12.5); Jubbulpore, 100,651 (+11.2).

**RELIGION.** Distribution of the population by religion, according to the 1911 census:

	<i>Br. India</i>	<i>Native States</i>	<i>Total</i>
Hindus .....	163,621,431	53,965,461	217,586,892
Sikhs .....	2,171,908	842,558	3,014,466
Jains .....	458,578	789,604	1,248,182
Buddhists .....	10,644,409	77,044	10,721,453
Parsis .....	86,155	13,941	100,096
Mohammedans .....	57,423,889	9,223,410	66,647,299
Christians .....	2,492,284	1,883,919	3,876,203
Jews .....	18,524	2,456	20,980
Animists .....	7,348,024	2,947,144	10,295,168
Other and un-specified .....	2,840	84,761	37,101
<b>Total</b> .....	<b>244,267,542</b>	<b>69,280,298</b>	<b>313,547,840</b>

\* Religion was not recorded in the case of 1,608,556 persons in the North-West Frontier Province.

The proportion of Hindus per 10,000 inhabitants was 7034 in 1901 and 6931 in 1911; Mohammedans, 2122 and 2126; Buddhists, 322 and 342; Animists, 292 and 328; Christians, 99 and 124.

The chief castes, with their numerical strength in 1911, include the following: Sheikh, 32,131,342; Brahman, 14,598,708; Chamar, 11,493,733; Ahin, 9,508,486; Rajput, 9,430,095; Burmese, 7,644,310; Jat, 6,964,286; Maratha, 5,087,436; Kunbi, 4,512,737; Teli and Tili, 4,233,250; Pathan, 3,796,816; Kurmi, 3,735,651; Kumhar, 3,424,815; Kapu, 3,361,621; Mahar, 3,342,680; Koli, 3,171,978; Hajjam, 3,013,399; Lingayat, 2,976,293; Gond, 2,917,950; Jolaha, 2,858,399; Palli, 2,828,792.

**EDUCATION.** The 1911 census failed to record literacy in the case of 1,741,007 persons. Of the remainder, 313,415,389 persons (160,418,470 male, 152,996,919 female), literates numbered 18,539,578 (16,938,815 male, 1,600,763 female). Persons literate in English numbered 1,670,387 (1,518,361 male, 152,026 female).

In 1914, the number of educational institutions in India (exclusive of British Baluchistan) was 185,584, with 7,531,515 scholars. These institutions are classified in the table below:

	<i>Institutions for</i>		<i>Scholars</i>	
	<i>Males</i>	<i>Females</i>	<i>Males</i>	<i>Females</i>
University ..	183	14	46,867	470
General				
Primary ..	116,718	14,731	4,612,386	909,657
Secondary ..	6,303	573	996,013	79,711
Special .....	6,261	947	175,572	30,490
Private .....	37,754	2,105	596,888	83,461
<b>Total</b> ..	<b>167,214</b>	<b>18,370</b>	<b>6,427,726</b>	<b>1,108,789</b>

Notwithstanding the prevalence of illiteracy, education has made considerable progress in recent years, and much attention has been given by the Department of Education to primary, commercial, and technical instruction.

**AGRICULTURE.** The reported total area cropped in British territory in 1913-14 was 246,989,228 acres; the net area (that is, the total area less areas cropped more than once) was 219,191,773 acres, as compared with 224,165,602 acres in 1912-13. The area under food grains in 1913-14 was 191,573,393 acres, of which 76,907,895 acres were under rice, 22,685,024 wheat, 21,405,397

jawar, and 15,385,537 bajra; oilseeds, 14,658,027 acres; cotton, 15,844,363; jute, 3,137,165; other fibres, 913,803; sugar, 2,707,373; tobacco, 1,001,708; tea, 572,108. Some of the more important estimated yields in the year 1913-14 (including crops in certain of the native states) are: rice (cleaned), 28,167,000 tons; wheat, 8,427,000 tons; tea (calendar year), 307,249,600 pounds; cotton, 5,797,000 bales (of 400 pounds); jute, 8,893,900 bales (of 400 pounds); linseed, 382,200 tons; rape and mustard, 1,042,900 tons; sesamum (til), 407,900 tons; groundnuts, 731,900 tons; raw sugar, 2,262,600 tons; indigo, 26,800 hundredweight.

Area in hectares and yield in thousands of metric quintals, with yield per hectare in 1915, are reported as follows (the figures for 1916 are subject to revision):

	<i>Hectares</i>		<i>1000 Qs.</i>		<i>Qs. ha.</i>
	<i>1915</i>	<i>1916</i>	<i>1915</i>	<i>1916</i>	
Wheat ..	13,141,988	12,198,269	102,529	86,547	7.8
Rice .....	31,076,187	.....	334,046	.....	10.7
Cotton ..	7,270,886	.....	6,929	.....	1.0
Linseed ..	1,345,561	1,342,824	4,034	4,816	6.4
Kape and mustard ..	2,633,253	2,579,026	12,386	11,004	4.7

**COMMERCE.** Import and export values for the year ended March 31, 1914, reached the highest mark in the history of British India. The decrease in the foreign trade in the fiscal year 1915 was largely due to the disorganization of the steamship services between British India and other countries as a result of the great war. Imports of private merchandise and exports of private Indian merchandise combined were valued at £210,275,961, as compared with £284,966,287 in 1914; the decrease in 1915 was 26.2 per cent, the decrease in imports being 24.7 per cent and in exports 27.3 per cent. Of the imports, 74.1 per cent came from countries of the British Empire, which received 47.3 per cent of the exports; the corresponding figures in 1914 were about 70 and 37 per cent. For years ended March 31st, the following table shows sea-borne imports and exports, in thousands of pounds sterling:

	<i>1904-05</i>	<i>1909-10</i>	<i>1913-14</i>	<i>1914-15</i>
<i>Imports:</i>				
Private mdse. ....	64,452	78,040	122,165	91,958
Govt. stores .....	5,156	3,727	5,873	4,668
<b>Total mdse. ....</b>	<b>69,608</b>	<b>81,768</b>	<b>127,539</b>	<b>96,620</b>
Private treasure ....	22,018	24,951	24,414	14,514
Govt. treasure .....	4,320	65	4,546	25
<b>Total treasure ....</b>	<b>26,339</b>	<b>25,016</b>	<b>28,960</b>	<b>14,539</b>
<b>Total imports ....</b>	<b>95,947</b>	<b>106,783</b>	<b>156,498</b>	<b>111,159</b>
<i>Exports:</i>				
Indian produce .....	102,761	122,998	162,801	118,323
Foreign produce .....	2,249	2,259	3,118	2,738
Govt. stores .....	138	55	86	389
<b>Total mdse. ....</b>	<b>105,148</b>	<b>125,312</b>	<b>166,005</b>	<b>121,451</b>
Private treasure ....	5,392	4,262	4,701	3,202
Govt. treasure .....	5,635	4	21	1,824
<b>Total treasure ....</b>	<b>11,027</b>	<b>4,266</b>	<b>4,722</b>	<b>5,026</b>
<b>Total exports ....</b>	<b>116,175</b>	<b>129,578</b>	<b>170,727</b>	<b>124,977</b>
Net exps. mdse. ....	35,540	43,545	38,466	24,831
Net imp. treas. ....	15,312	20,750	24,288	11,013
<b>Excess exports ...</b>	<b>20,228</b>	<b>22,795</b>	<b>14,229</b>	<b>13,818</b>

In the fiscal years 1914 and 1915, some of the principal imports for home consumption were valued as follows, in thousands of pounds sterling: cotton manufactures, 44,199 and 32,666 (including yarn, 2776 and 2568); sugar, 9971 and 7022; railway material, 6690 and 6722; iron and steel, 10,663 and 6513; machinery, etc., 5172 and 4027; mineral oil, 2744 and 2938; copper, 2745 and 1849; hardware, etc., 2632 and 1707; provisions, 1649 and 1405. Leading exports of Indian produce in 1914 and 1915, in thousands of pounds sterling: raw cotton, 27,362 and 22,304; jute manufactures, 18,849 and 17,213; rice, 17,756 and 11,439; tea, 9983 and 10,347; seeds, 17,116 and 9769; raw jute, 20,551 and 8607; wheat and flour, 9590 and 6159; cotton manufactures (including yarn), 8080 and 5340; hides and skins, 7815 and 5207; leather, 2833 and 3173; millet, barley, pulse, etc., 2767 and 1768; wool, 1670 and 1570; opium, 2280 and 1176.

By principal countries, imports of merchandise and exports of Indian merchandise are shown below:

	Imports		Exports	
	1913-14	1914-15	1913-14	1914-15
United Kingdom ...	78,388	61,959	38,237	37,258
Java .....	7,164	5,480	1,285	1,226
United States .....	3,194	3,120	14,519	11,562
Germany .....	8,443	3,100	17,571	6,785
Japan .....	3,187	2,966	15,116	10,436
Straits Settlements ..	2,282	2,250	4,367	3,365
France .....	1,794	1,175	11,788	5,887
Belgium .....	2,839	1,086	8,043	3,506
China .....	1,187	1,045	3,801	2,688
Italy .....	1,464	1,015	5,223	4,570
Austria-Hungary ...	2,860	861	6,650	3,012
Hongkong .....	655	682	5,102	2,809
Australia .....	611	567	2,729	2,625
Ceylon .....	539	528	5,866	5,033
Total, including other .....	122,165	91,953	162,801	118,323

In addition to the sea-borne trade, which alone has been considered in the foregoing paragraphs, there is a land foreign trade of considerable magnitude. Imports and exports by land in 1913-14 were valued at £8,014,000 and £6,282,000 respectively; in 1914-15, £7,629,000 and £6,330,000.

**RAILWAYS.** Providing additional and adequate railway facilities for India by 1916 had become a most serious problem. The Indian Railway Board, in order to determine a definite policy for the future sought the opinion of commercial bodies on the subject, and they were asked whether in their opinion state-managed or company-managed lines had given the best services to the public. In the meantime the members of the board were personally investigating the problem in all its bearings.

The Railway Board during the year sanctioned reconnaissance surveys by the Great Indian Peninsula Railway for the following lines of railway on the 2-feet 6-inch gauge: (1) from Damoh, on the Great Indian Peninsula Railway, to Amangang via Hatta, a distance of about 60 miles. (2) From Mau-Ranipur, on the Great Indian Peninsula Railway, running north to Garotha and south via Tehri to Maraura, with a connection from Tehri to Lalitpur, a distance of about 120 miles.

**SHIPPING.** Shipping engaged in the foreign trade, with cargo and in ballast, is shown in the following table:

Entered:	1913-14		1914-15	
	Vessels	Tons	Vessels	Tons
British .....	2,444	6,198,848	2,368	4,902,067
Br. Indian .....	243	152,678	315	149,323
Foreign .....	754	2,209,491	462	1,204,945
Native .....	853	63,062	792	56,210
Total .....	4,294	8,624,079	3,937	6,312,545
<b>Cleared:</b>				
British .....	2,507	6,486,282	2,459	5,176,751
Br. Indian .....	260	145,216	285	117,058
Foreign .....	712	2,066,960	460	1,191,831
Native .....	844	63,871	819	60,200
Total .....	4,323	8,762,329	4,023	6,545,840

The chief ports are Calcutta and Bombay: next in importance are Karachi, Rangoon, and Madras.

**COMMUNICATIONS.** The total length of railway in operation in British India and the native states, March 31, 1915, was 35,285 miles, as compared with 34,656 in 1914. In 1915, state lines operated by the state totaled 7364 miles; state lines operated by companies, 18,810 miles; companies' lines subsidized by the government of India, 2214 miles; native state lines operated by native states, 2240 miles.

Telegraphs March 31, 1915: 10,661 offices, with 84,112 miles of line and 330,033 miles of wire. There are several radiotelegraph stations under government operation. Post offices, March 31, 1915, 19,158, as compared with 18,946 in 1914.

**FINANCE.** The standard unit of value is the British pound sterling, the par value of which is \$4.86656; but the current coin, as well as the common money of account, is the rupee, worth one-fifteenth of the pound sterling, or 32.444 cents. For the fiscal year ending March 31, 1917, the budget estimate of the gross revenue of British India was £86,199,600, and the estimate of expenditure £85,147,200.

The following table shows the principal sources of gross revenue for fiscal years, in thousands of pounds sterling (revised estimates for 1915-16, and budget estimates for 1916-17):

	1912-13	1913-14	1915-16	1916-17
Land revenue .....	21,282	21,392	21,735	21,952
Opium .....	5,125	1,625	1,181	2,287
Salt .....	3,834	3,445	3,491	3,988
Stamps .....	5,069	5,318	5,388	5,457
Excise .....	8,278	8,894	8,533	8,538
Provincial rates .....	552	180	39	28
Customs .....	7,197	7,558	5,748	7,698
Income tax .....	1,742	1,950	2,022	2,913
Forest .....	2,153	2,230	2,002	2,035
Registration .....	482	519	510	517
Tribute (native sts.) ..	624	617	605	614
Interest .....	1,474	1,352	1,076	1,155
Post office .....	2,262	2,410	3,765	3,877
Telegraphs .....	1,174	1,188		
Mint .....	487	340	74	73
Civil departments .....	1,135	1,408	1,546	1,550
Miscellaneous .....	765	773	645	565
Railways (net) .....	17,372	17,626	17,339	16,722
Irrigation .....	4,411	4,713	4,760	4,815
Other civil pub. works ..	355	298	289	270
Military receipts .....	1,388	1,370	1,173	1,166
Total .....	86,863	85,217	82,620	86,200

The table below shows for fiscal years the principal items of gross expenditure charged against revenue, in thousands of pounds sterling (revised estimates for 1915-16 and budget estimates for 1916-17). The first item, direct demands on the revenue, includes refunds and drawbacks, assignments and compensations, together with collection charges, which comprise

hend land revenues, excise, customs, etc., with production costs in the salt and opium monopolies:

	1912-13	1913-14	1915-16	1916-17
Direct demands . . . . .	8,653	9,275	9,383	9,451
Interest . . . . .	1,811	1,516	1,185	990
Post office . . . . .	2,027	2,092	3,221	3,504
Telegraphs . . . . .	1,106	1,181		
Mint . . . . .	142	133	86	90
Civil departments . . . . .	16,688	17,934	19,067	19,323
Misc. civil charges . . . . .	4,926	5,404	5,131	5,283
Famine relief and insurance . . . . .	1,000	1,000	1,000	1,000
Railway account* . . . . .	12,568	12,836	13,901	14,217
Irrigation . . . . .	3,302	3,532	3,769	3,771
Other public works . . . . .	6,064	7,010	5,464	4,718
Military services . . . . .	20,953	21,266	23,016	23,166
Add † . . . . .	4,514	326	47	17
Deduct ‡ . . . . .		609	704	383
<b>Total . . . . .</b>	<b>83,755</b>	<b>82,895</b>	<b>84,607</b>	<b>85,147</b>

\* Working expenses are treated as deduction from revenue instead of expenditure. † The additions are the portion of allotments to provincial governments not spent by them in the year. ‡ The deductions are the portion of provincial expenditure defrayed from provincial balances.

In addition to expenditure charge against revenue, there was capital expenditure on railways and irrigation amounting, in 1912-13, to £10,738,694; in 1913-14, £12,365,740; in 1915-16 (estimate), £5,769,200 and £333,300 in connection with the new capital at Delhi; in 1916-17 (estimate), £3,705,900 and £266,700 at Delhi.

On March 31, 1915, the public debt stood at £320,729,023, as compared with £307,391,127, in 1914.

**GOVERNMENT.** The King of Great Britain and Ireland is Emperor of India. In England, the administration of Indian affairs is intrusted to the secretary of state for India (a member of the British cabinet). In India, the executive authority rests with the governor-general in council. The council consists of six members, appointed by the crown, and of the commander in chief of the army in India. The governor-general has a legislative council, which, in addition to ex-officio members, consists of 28 official and 32 non-official members (including 27 elected). There are similar legislative councils in Bengal, Bombay, Madras, Bihar, and Orissa, the United Provinces, the Punjab, the Central Provinces, and Berar, Assam, and Burma. The native states are governed by their princes, ministers, or councils, but the Government of India exercises control in varying degrees. In March, 1916, Baron Hardinge of Peshurst was succeeded as governor-general by Baron Chelmsford.

#### HISTORY

**THE VICEROY.** Lord Hardinge's term officially would have expired in November, 1915, but before that date was reached there was so much objection to his withdrawal that the government consented to extend the term until the end of March, 1916. At assemblies of the Indian National Congress and other native bodies, resolutions were passed praying for a further extension of the term, but this the government was unwilling to grant. Everywhere there had been the greatest satisfaction with the Viceroy's administration and it had been hoped that he might continue throughout the war, but there were serious objections to the prolongation of the

term for an indefinite time. On January 14th, the appointment of Lord Chelmsford was announced officially. Lord Chelmsford had held the office of Governor of Queensland, and afterward that of New South Wales, where his administration was highly successful. At the time of his appointment he was serving as captain in his Territorial regiment in the Himalayas.

**LORD HARDINGE'S VICEROYALTY.** Characteristic of Lord Hardinge's administration as reviewed in the press appears to have been the fact, in the first place, that he possessed the confidence of the people. He showed much tact in dealing with the disturbances that arose early in his viceroyalty. Soon after the war broke out there was a spontaneous display of loyalty on the part of the natives. Attempts to cause dissension by means of German agents were reported, and for some time there were very disturbed conditions in the Punjab and in lower Bengal, but the Viceroy dealt with these vigorously and yet showed a spirit of clemency toward many of the accused. In short his policy resulted in the swift suppression of these disorders. As to the Mesopotamian campaign the question of Lord Hardinge's share of the responsibility remained unsettled. During his administration there were many important legislative changes. The new capital was established. The Bengal provinces were rearranged. Changes were made in the provincial administration. Some of the features of his administration were his cordial relations with the princes and chiefs, the great amount of attention he devoted to educational progress, his vigorous conduct of external politics, his concern in the events of the Burmo-Chinese frontier, and his friendly arrangements with the Government of Afghanistan. He also did much to promote favorable relations between India and the rest of the Empire, especially in the matter of indentured emigration. Another policy of his which won him support in India was his effort to secure for India official representation in the next Imperial Conference.

**INDENTURED LABOR.** It was announced by the Viceroy on March 21st that the policy of providing for the eventual abolition of indentured labor in Jamaica, Trinidad, British Guiana, Dutch Guiana, and Fiji had been accepted by the Secretary of State for India. The system of indenturing coolie labor outside India began in 1842, and of late years had been under the regulation of the Emigration Act of 1883. It was required that no native should emigrate except under a contract to certain countries which had given the British government guarantees that satisfactory measures would be taken for their protection. The recruiting of such labor was carried out under licensed agents. Formerly they were taken to certain territories outside the British Empire, but in 1886 emigration to the French colonies was prohibited and there remained only Dutch Guiana outside the British Empire. Of late years about 10,000 coolies have emigrated annually under average conditions. Many of them remain permanently in the countries to which they are sent, after the expiration of their term of indenture. On an average only about 4000 or 5000 have returned to India. Great numbers of them have remained in South Africa. In Natal alone the number of coolies permanently settled was estimated in 1910 at 10,000. This condition of things led the Indian

government to prohibit emigration to Natal. Immigration to Mauritius ceased in 1910. The decision to put an end to this system was received with hearty approval among the natives, who have been strongly opposed to the system, regarding it as a badge of slavery. In his announcement Lord Hardinge said that the present system of recruiting would have to continue until a new method had been worked out with the Colonial Office and the crown colonies concerned.

**INDIAN LOYALTY.** There were some signs of disaffection, and these were seized upon in hostile quarters and magnified. German reports of disorders were denied, but on April 14th it was learned from the Secretary of State for India that two uprisings had been suppressed in the Punjab and Bengal, though they were characterized as unimportant. On May 19th Lord Hardinge admitted that in the previous year there had been seven attacks of a serious nature by the tribesmen of the northwest border. Again on July 20th Lord Crewe implied that but for the presence of British troops in Mesopotamia, which had impressed the Mohammedans with a show of force, there might have been a serious disaster. The change of administration with the appointment of the new Viceroy on July 14th caused no crisis. The Indian National Congress at Bombay, December 31st, and the All-Indian Moslem League Congress both declared their loyalty, but at the same time demanded more autonomy for India. The Sultan Mohammed Agha Khan, also declared that the Mohammedan population was unswervingly loyal. Official statements showing the contributions of India to the imperial cause were issued from time to time. British India and the protected states had furnished 21 cavalry regiments and 76 infantry battalions. From India had come 300,000 troops, who were distributed in France, China, Egypt, Mesopotamia, East Africa, Gallipoli, and Kamerun. The native princes offered contributions and personal services as well, and one of them, the Maharaja of Mysore, had given \$1,665,000. Moreover, as proof that no serious disturbance was threatened, the fact was cited that the army of occupation, ordinarily 73,000 strong, had been reduced to less than 15,000.

**INDIANA. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 2,826,154. The population in 1910 was 2,700,876.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture in 1915-16, were as follows:

	Acreage	Prod. Bu.	Value
Corn . . . . . 1916	5,137,000	174,658,000	\$146,713,000
1915	5,025,000	190,950,000	97,884,000
Wheat . . . . . 1916	1,620,000	19,440,000	82,854,000
1915	2,750,000	45,580,000	46,492,000
Oats . . . . . 1916	1,750,000	52,500,000	26,775,000
1915	1,638,000	65,520,000	22,277,000
Potatoes . . 1916	74,000	3,256,000	5,763,000
1915	75,000	7,125,000	8,990,000
Hay . . . . . 1916	2,800,000	3,312,000	36,101,000
1915	2,020,000	3,030,000	39,330,000
Tobacco . . 1916	14,800	13,764,000	1,789,000
1915	18,500	11,340,000	828,000
Rye . . . . . 1916	185,000	3,590,000	3,082,000
1915	200,000	3,200,000	2,624,000
Barley . . . 1916	15,000	405,000	804,000
1915	13,000	364,000	287,000

a Tons. b Pounds.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914.

	1909	1914
Number of establishments . .	7,969	8,022
Average number of wage earners . . . . .	186,984	197,503
Capital Invested . . . . .	\$508,717,000	\$668,863,000
Wages . . . . .	95,510,000	119,259,000
The value of materials used .	334,375,000	423,857,000
The value of products . . . . .	579,075,000	730,795,000

**MINERAL PRODUCTION.** The coal production of the State in 1916 was estimated at 19,000,000 tons, compared with 17,600,152 in 1915. The greater part of this increase was in Knox County, and the fields of the north, and was made in the last six months of the year. There were local strikes in the year, which affected labor for a period, in some of the large mines. The mines also suffered from car shortage. Shipments were made during the year to points as far east as central New York, and large quantities were shipped to Ohio and Michigan.

The petroleum marketed in the State in 1915 amounted to 4,269,591 barrels. The oil field of the State is a part of the Lima, Ind., field. By far the larger production is obtained from the fields situated in Ohio. There was little activity in developing new territory during the year. The production of coal in the State in 1915 was 17,600,152 short tons. This was an increase of about 2 per cent over the production of 1914. The number of men employed in the mines of the State during the year decreased from 23,175 in 1914 to 22,777 in 1915.

**TRANSPORTATION.** The total railway mileage of the State in 1916, was 7791. Roads having the longest mileage were the Pittsburgh, Cincinnati, Chicago, and St. Louis, 751; New York Central, 464; Lake Erie and Western, 741; Cincinnati, Hamilton, and Dayton, 609; Chicago, Indianapolis, and Louisville, 595.

**EDUCATION.** The total number of school children in the State in 1916 was 774,342. This includes children between the ages of 6 and 21. The enrollment was 564,252, and the average daily attendance 463,920. The number of teachers employed was 19,648. The average yearly salary of teachers was \$587.51. The total amount expended for teaching in the public schools of the State was \$11,553,513.

**FINANCE.** Statistics for the finances of the State are available for only as late as 1914. In that year the total receipts from all sources, including balance of \$378,271, was \$12,922,278. The expenditures for the fiscal year left a balance on hand on Sept. 30, 1914, of \$649,964.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include the Indiana Reformatory at Jeffersonville, the Indiana State School for the Deaf at Indianapolis, the Central Hospital for the Insane at Indianapolis, the Indiana State School for the Blind at Indianapolis, the Indiana State Prison at Michigan City, the Indiana Boys' School at Plainfield, the Soldiers' and Sailors' Orphans' Home at Knightsville, Indiana Women's Prison at Indianapolis, School for the Feeble-Minded at Fort Wayne, the Northern Hospital for the Insane at Logansport, Eastern Hospital for the

Insane at Richmond, Southern Hospital for the Insane at Evansville, State Soldiers' Home at Lafayette, Indiana Girls' Home at Clermont, Southwestern Hospital for the Insane at North Madison, Indiana Village for Epileptics at New Castle, and the Hospital for the Treatment of Tuberculosis at Rockville. There is also a State farm at Putnamville. There were about 15,000 inmates in these institutions in 1916. They are maintained by appropriations from the State general fund made biennially by the Legislature.

**POLITICS AND GOVERNMENT.** The 1916 election in Indiana resulted in the defeat of the Democratic State and national tickets, and the return of the State to the Republican column. It also marked the practical wiping out of the Progressive party which maintained an organization, but polled only an insignificant number of votes although it was the second party in 1912. The important issues in the State were the Federal Adamson railroad law, the record of the Democratic party in State and local affairs which was attacked by the Republicans, the administration of the public utilities law, dissatisfaction with which was general, gang rule and machine politics in Indianapolis and other large cities of the State where the Democratic party was in power, and the question of tax reform. Public interest in the election was slow in awakening, but it became keener and the finish of the campaign was one of the most exciting in years, marked by great demonstrations, "red fire" parades and other features characteristic of old-time campaigns.

James P. Goodrich, candidate for governor on the Republican ticket, based his appeal for election primarily on promises of economy in State affairs, reform of the existing tax system, and of public utilities commission practices. J. A. M. Adair, the Democratic candidate for governor, the incumbent of the office, Governor Samuel L. Ralston, and other Democrats, placed emphasis on the achievements of the national administration and used as a slogan "the State is out of debt and the nation out of war."

The Republican State platform criticized the Wilson administration, favored a merchant marine, adequate preparedness, public economy, a State budget system, tax reform, and road improvements; it opposed entangling alliances, criticized the State primary law, and denounced "pork barrel" methods. The Democratic State platform praised the record of the party in State and national affairs. Tax reform and the public utility commission issues were touched on in general terms, economy was pledged, and the existing liquor laws were approved. Neither party definitely committed itself to prohibition or woman suffrage.

Indiana was singularly situated among the States in having a candidate for Vice-President, each of whom had held that office, on the tickets of each of the major parties, and the prohibition candidate for President, ex-Governor J. Frank Hanly. Thomas R. Marshall, Democrat, was reelected Vice-President over Charles W. Fairbanks, his Republican opponent.

Affairs in Marion County, in which Indianapolis, the largest city of the State, is situated, are believed to have had an important bearing on the outcome of the State election. A number of officials in that county were indicted for

fraud at a preceding primary and election, policemen were charged with driving voters from the primary polls, and several city employees were indicted for graft in connection with padded payrolls. The Republican plurality in the county was about equal to the plurality of that party in the State.

Owing to the death of Senator Shively early in 1916, two Senators instead of one were elected to fill out the State delegation. Thomas Taggart had been appointed by Governor Ralston to serve out Senator Shively's term until the first general election and he was later nominated by the Democratic State convention as a candidate for the remainder of the dead Senator's term against James E. Watson, the second choice of the Republican primary, which nominated Harry S. New for the regular vacancy. John W. Kern, Democratic incumbent, was the candidate against Mr. New for the long term. Both Republicans were elected.

The official vote in the senatorship contest follows: Long term—Harry S. New (Republican), 337,089; John W. Kern (Democrat), 325,588; John N. Dyer (Progressive), 4272; Joseph Zimmerman (Socialist), 21,558. Short term—James E. Watson (Republican), 325,193; Thomas Taggart (Democrat), 325,577; John S. Clifford (Progressive), 4798; Edward Henry (Socialist), 21,626.

For President the vote of the two leading candidates was: Hughes, 341,005; Wilson, 334,063.

In the governorship contest the vote was: James P. Goodrich (Republican), 337,831; J. A. M. Adair (Democrat), 325,060.

The entire Republican State ticket was elected by corresponding or somewhat smaller pluralities. The Republicans elected 9 of Indiana's 13 Congressmen, and the Democrats 4, against a representation at present of 11 Democrats and 2 Republicans. Wilson ran ahead of the Democratic State ticket by several thousand votes and Hughes led the Republican State ticket, but Hughes's plurality over Wilson was smaller than that of any of the other Republican State candidates over their respective opponents.

A movement was begun during the year to start a number of State parks for the preservation of the most impressive scenic tracts and historic spots in the State. Governor Ralston issued a proclamation calling upon the people of the State for contributions of money needed for the purchase of the sites.

On February 7th city officers, convicted in 1915 in election conspiracy cases, were released from the Federal penitentiary, having served their term. A large number of officials, including the former mayor and sheriff, remained in prison. Their conviction was sustained by the United States District Court of Appeals in Chicago on February 2nd. These men are serving terms ranging from two to five years.

See also **CELEBRATIONS.**

**STATE OFFICERS.** Governor, James P. Goodrich; Lieutenant-Governor, Edgar Bush; Secretary of State, Ed. Jackson; Treasurer, Uz McMurtrie; Auditor and Commissioner of Insurance, Otto Klaus, Attorney-General, E. Stansbury; Adjutant-General, F. L. Bridges; Superintendent of Education, Horace Ellis—all Republicans.

**JUDICIARY.** Supreme Court: Chief Justice,

Charles E. Cox; Associate Justices, Moses B. Lairy, Douglas Morris, Richard K. Erwin, John W. Spencer; Clerk, F. Fred France.

## STATE LEGISLATURE:

	Senate	House	Joint Ballot
Republicans .....	24	65	89
Democrats .....	25	85	60
Progressives .....	1	..	1
Republican majority ....	..	80	28

**INDIANA, UNIVERSITY OF.** A State co-educational institution at Bloomington, Ind., founded in 1820. In the fall of 1916 the students numbered 2002 and the faculty 196. During the year Dr. H. L. Smith was elected dean of the School of Education to take the place of Dr. W. W. Black, resigned. Morton C. Campbell and Warren A. Seavey were elected to professorships in the School of Law. The productive funds of the institution amount to \$614,690, and during the year 1916 the income from all sources was \$764,370. The library contains 108,000 volumes. President, William L. Bryan.

**INDIANS. EDUCATION AND HEALTH.** A health campaign carried on in the various Indian reservations during the year resulted in a decrease in the death rate of approximately seven per thousand during 1916. Special attention was given to the health of infants. Additional physicians were employed and hospitals were constructed and placed in operation to aid in the campaign for better health. Educational facilities were provided for 1295 Indian children without school opportunities. A special effort was made for Navajo Indian children for whom facilities were provided for an increase of over 260 children. Arrangements were made for the enrollment of 2025 children. New courses of study were introduced in all the schools of service. A series of institutes was held during the summer in various places. Especial attention was given to industrial and economic courses.

**INDUSTRIES.** Great improvement was shown in the advancement of Indian industry during the year. This is shown by the fact that free rations were issued to 3807 able-bodied Indians as compared with 6650 for 1915. The total individual income of Indians under Federal supervision increased from \$15,308,665 in 1915 to \$15,069,515 in 1916. The number of Indian farmers increased from 31,956 in 1915 to 35,658 in 1916, the cultivated acreage from 664,539 to 668,552, and the value of crops produced from \$4,790,968 to \$5,293,719. See also ANTHROPOLOGY.

**INDIAN TRAINING AND INDUSTRIAL SCHOOL, UNITED STATES.** A non-sectarian co-educational institution for American Indians, at Carlisle, Pa. It was founded in 1879. In the fall of 1916 there were 769 students and 65 instructors. The school is supported chiefly by the Federal government, Congress appropriating annually about \$150,000 for this purpose. Two farms owned by the school are worked by the students and make a substantial contribution to its sustenance. In 1916 the library had 4000 volumes. President, Oscar H. Lipps.

**INDIA RUBBER.** See RUBBER.

**INDO-CHINA.** The southeastern peninsula of Asia, consisting of French Indo-China,

Burma, Siam, the Malay states, and the Straits Settlements proper. See these titles.

**INDUSTRIAL ACCIDENTS.** See OCCUPATIONAL DISEASES; WORKMEN'S COMPENSATION.

**INDUSTRIAL DISEASES.** See OCCUPATIONAL DISEASES.

**INDUSTRIAL RELATIONS COMMISSION.** This body was authorized by Congress in 1912. It was composed of nine persons equally divided between representatives of the public, employers, and employees. Its function was to inquire into the causes of industrial unrest, and, with an appropriation of \$500,000 and three years' time, it carried out an elaborate inquiry. Its *Final Report* was summarized in the 1915 YEAR BOOK. On April 28, 1916, Congress authorized the printing of 100,000 copies of this *Final Report* and of 10,000 copies of the testimony and findings. These were available for distribution by Senators and Congressmen at the close of the year in a set of 11 volumes of about 1000 pages each. Here will be found the testimony of prominent business men, labor leaders, economists, publicists, and other experts on every phase of the relations of labor and capital.

**INDUSTRIAL WORKERS OF THE WORLD.** The I. W. W. had its inception in the Colorado strike of 1903. Its organization was brought about by a combination of the Western Federation of Miners, the United Metal Workers, and the Labor Alliance in 1905. It has since split into two branches, with headquarters at Chicago and Detroit. It favors direct action, including sabotage and the general strike, favors industrial unionism in opposition to trade unionism, opposes resort to customary political methods, preaches industrial revolution and the immediate confiscation of capital goods.

During 1916 the organization was active in various parts of the country. In the summer I. W. W. members had fights in South Dakota with independents organized against them for work in the harvest fields. In New York City they took an active part in the garment workers' strike. They were also responsible for wrecking the offices of *Il Progresso Italo-Americano*, an Italian newspaper, because the editor had refused to aid a propaganda for the release of labor organizers imprisoned in Virginia, Minn., on a charge of murder. Several agitators were later indicted on the charge of inciting the riot. In September the I. W. W. members attempted to tie up the Jermyn & Company collieries at Scranton, Pa. The employees were about evenly divided between the I. W. W. and the United Mine Workers, and as the latter would not join in the strike it is alleged that the I. W. W. pickets tried to keep them away from their work. The burghs being unable to cope with the situation, the sheriff was summoned. A raid on a secret meeting was made by him with the aid of deputies and State troopers and 267 strikers were arrested on a charge of riot. The court on September 16th refused to give an immediate hearing on a writ of habeas corpus and also refused to reduce the bail totaling \$1,500,000 for those under arrest.

Elizabeth Gurley Flynn, who achieved notoriety in the Paterson strike of 1913, was acquitted in her trial at Paterson in December. Two years previously the jury had disagreed.

The testimony of detectives and policemen as to statements made by her was not given consideration. Her defense was carried out through a committee of 81 persons, including Mrs. O. H. P. Belmont, Mrs. Rose Pastor Stokes, Mrs. Inez M. Boissevain, and other noted women of New York, and William English Walling, Amos Pinchot, and five progressive clergymen, including the Rev. Percy Stickney Grant.

In the naturalization court at Wilkes-Barre, Pa., May 3rd, Judge Peter A. O'Boyle announced that members of the I. W. W. could not obtain citizenship papers in that county because they are undesirable as citizens since they countenanced and even instigated trouble and used un-American means in voicing their displeasure with conditions of which they did not approve.

As an outgrowth of a strike of shingle weavers, a pitched battle between 250 members of the Industrial Workers of the World on a steamer and a posse of citizens took place at Everett, Wash., November 5th. Trouble had been brewing for some months with several minor outbreaks in connection with the strike. After the outbreaks all members of the I. W. W. were forcibly expelled from Everett by a citizens' committee organized for the purpose. Some returned and were again forcibly ejected. But in October the official organ of the I. W. W., the *Industrial Workers*, called for 2000 volunteers to avenge the forcible expulsion of men at Everett and to "vindicate the right of free speech." Two steamers were chartered for the occasion. These boats with 400 armed men on board left Seattle, November 5th. The first boat to reach Everett was met at the wharf by the sheriff and posse of deputies and citizens, who refused to let the I. W. W.'s land. After some arguing, shooting was begun: about 1000 shots were fired and about 40 persons were injured and 7 killed.

Patrick Quinlan, an I. W. W. agitator, sentenced to serve not less than two years in the New Jersey State Prison for inciting riots in the Paterson silk strike of 1913, was released November 24th. Quinlan had written a letter to Judge Abram Klenert apologizing for the language which he had directed against the courts. This apology, Quinlan's failing health, and petitions from 22,000 persons asking the liberation of Quinlan, caused his release.

**INFANT DEATH RATE.** See VITAL STATISTICS.

**INFANTILE SPINAL PARALYSIS.** See POLIOMYELITIS.

**INFECTIO.** See SURGERY.

**INITIATIVE, REFERENDUM, AND RECALL.** See ELECTORAL REFORM.

**INJUNCTION.** See LABOR, AMERICAN FEDERATION OF.

**INSANITY.** The National Committee for Mental Hygiene has pursued its work of surveying the mental defectives throughout the country, with the help of the Rockefeller Foundation, and operating from 50 Union Square, New York. Interest in the prevention of insanity as well as of feeble-mindedness is fully aroused in several States. Somewhat on the lines of the work of the Committee for Mental Hygiene, Jackson, of the Philadelphia Hospital for the Insane, has suggested a plan for the establishment of bureaus of mental hygiene as subdivisions of departments of health. In

Philadelphia the proposed bureau would work through various psychiatric centres, the physicians thereto assigned acting as inspectors who are assigned to hospitals for contagious diseases. Thus is the matter placed on the basis of quarantine, as suggested by Adolf Meyer, then of New York, in 1907. The advantages claimed are: Improved care with less cost of the indigent insane; avenues afforded for investigation and research, and for establishment of clinics; weeding out borderland cases, separating the acute and recoverable, and securing early treatment; relieving the psychiatric wards of general hospitals; permitting return home of recovered or improved patients under social service workers; and protecting the patient and society from harm.

Abbott, of the staff of Waverley, Mass., Hospital for the Insane, lists as avoidable, forms of mental disease, feeble-mindedness, dementia præcox, manic-depressive psychoses, psychoses due to destructive disease of the brain, toxic psychoses, and others. He urges that manic-depressives be treated as fatigue psychoses, and urges rest and food in all cases of easy fatigue, as a preventive measure. He states that fully 12½ per cent of the cases of insanity admitted are due to alcoholism, and in an indefinite number it is the precipitating cause, and urges instruction of the public without prejudice or sentiment.

Urstein's observations upon soldiers suffering from mental disturbance resulted in the establishment of the fact that even fractures of the skull, hemorrhages, and other circumscribed lesions may affect the mind. Mental confusion usually appears immediately after the brain trauma, though in some cases after some hours or days. Delirium and somnolence are unfavorable symptoms, often denoting brain abscess or meningo-encephalitis. The most frequent psychosis was katatonia, next frequently psychopathic constitutional anomalies, epileptic insanity, and finally manic-depressive states. Exhaustion psychoses and hysterical cases were noted. It seemed to Urstein that psychoses among soldiers developed only upon a predisposition.

The Board of Control of Lunacy in England has issued a report showing increase in insanity. In 1859 36,480 insane persons were under control in England and Wales. In 1899 there were 100,000, and in 1915, 140,466. In the same period, private lunatics had increased in number from 4397 to 9968. In 1859 the ratio to population was 18.5 per 10,000, rising to 37.7 in 1915. These figures are not quite accurate, because the diagnosis of insanity is more exact to-day, and many formerly ignored cases are under public care. But a decided increase is beyond doubt. Causes assigned include syphilis, alcohol, tobacco, sexual excess, overstrain, and over-excitement. Mercier, of London, considers that insanity may be due to excessive indulgence in fat or sugar. In the face of these reports, a striking decrease of lunacy is observed in London. Pauper, criminal, and private patients numbered 20,886 Jan. 1, 1916, compared with 21,539 a year before, while the total number (including those in workhouses and at home) was 28,252, against 29,211 in 1915. Private patients decreased from 488 to 458, in the same time. There is proportionately a greater reduction of males,

The decrease of London's lunatics is assigned to the reduction of poverty, due to the employment consequent on the war, and the withdrawal of a large part of the male population from civil work to the army. The annual reports of the commissioners of lunacy for England and Wales, as well as for Scotland, and of the inspector of lunatics for Ireland, are not obtainable this year.

The Massachusetts Board of Insanity reported on Nov. 30, 1915, a total of 14,746, being 1 insane to every 250 of the population of the State. In addition, there were 941 patients temporarily absent from institutions, and a considerable number of others in the community who had been previously discharged or had never appeared in institutions for the insane. Of the total stated, 7169 were males and 7577 females, and of these 107 men and 243 women, total 350, were in private institutions. These figures show an increase over 1915 of 615 public and 9 private patients, total 624; and over 1914 and 1913 of respectively 356 and 401. All admissions to public institutions and McLean Hospital were 4171, during the year, compared with 4068 the previous year. The increase this year was 103, as compared with a decrease of 17 the previous year. Voluntary admissions of insane reached 685 as against 543 the previous year. Of this number, 81 in public institutions and 3 in McLean required subsequent commitment. First admissions numbered 3147, compared with 2986 the year before. Of the first cases, 45.59 per cent were of foreign birth, and 70.39 per cent of foreign parentage. Alcohol was a causative factor in 17.06 per cent, heredity in 16.65, senility in 10.17, coarse brain lesions in 5.82, and syphilis in 9.66 per cent. The mental disease was classed as curable in 21.48 per cent of first cases, compared with 21.20 a year before, and 22.69 for the last five years' average. Of the first admissions, manic-depressive psychoses numbered 12.23 per cent; acute alcoholic insanity, 5.02; dementia præcox, 25.55; chronic alcoholic insanity, 4.48; senile dementia, 9.02; general paralysis, 8.23; and coarse brain lesions, 8.80 per cent. Following were the discharges: 410 as recovered; 305 as capable of self-support; 794 as improved; 510 as not improved; and 167 as not insane (alcoholics, deliria, etc.).

New York changed the beginning of her fiscal year from October 1st to July 1st, thus making comparison of previous figures difficult. By adding one-third of each nine months' figure to itself, a fair result may be reached. In New York, June 30, 1916, the number of the committed insane and voluntary patients in State hospitals, together with committed insane in licensed private retreats, were 17,863 men and 19,718 women, making a total of 37,581 patients (an increase of 918 over last year); of which number 1402 were inmates of Matteawan and Dannemora, the criminal institutions, and 966 were in licensed private retreats. There were 1340 on parole from civil hospitals. The net increase in the civil hospitals for the nine months was 905, against 939 for the year 1915, and 691 for two years ago. During the nine months 208 were returned to other States or deported to foreign countries, against 490 the previous year, great difficulties operating to prevent ocean travel of patients. The total number admitted to civil hospitals for the year

was 6223, of which number 4903 were first admissions, and 1320 were readmissions. From the 14 civil hospitals 1186 were discharged as recovered, and 1216 as improved; while 2522 died during the period. The amount disbursed for maintenance was \$5,657,739.42. Upon new buildings, extraordinary repairs or equipment, or emergencies was expended the sum of \$506,607.98. The per capita cost of maintenance for the period, omitting calculation of the cost of lodging, was \$165.32, averaging \$220.43 for a year, against \$210.25 last year. The ratio of the insane to the general population of the State was 1 to 261.

The chief contributing cause of insanity, next to heredity, is syphilis, and alcohol is the determining cause in many cases. These two preventable causes were, in 1916, precipitating factors in 22.7 per cent of the new admissions in the civil hospitals.

Of the first admissions during the past year, 48.5 per cent were of foreign birth, and 76.3 per cent of foreign or mixed parentage.

In the attempt to limit the procreation of the unfit, laws have been passed in several States, authorizing certain officials to sterilize certain insane, feeble-minded, epileptics, and recidivists. The operation of the laws has been impeded by a lack of public sentiment in most cases, in spite of the startling figures of the proportion of the dependent and unfit as well as the criminal, whose ranks would be much depleted in a generation were the classes named prevented from propagating their kind. The American Institute of Criminal Law and Criminology gives the following summary of the want of activity in the various States in this field: Indiana, no operations since 1908; Washington, no operation in a year, no report; California, insane, 634, criminal 1, since passage of law; Connecticut, insane 21, since passage of law; Nevada, no operations; Iowa, no operation under old law; New Jersey, no operations; New York, no operations, and a case pending before the courts; Michigan, no operations; Kansas, no information, and no operations up to 1915; Wisconsin, feeble-minded, 24. In Washington alone the law is punitive. See also CHARITIES.

**INSECTS.** See ENTOMOLOGY.

**INSECTS, PROPAGATION OF DISEASE BY.** See ROCKY MOUNTAIN SPOTTED FEVER.

**INSTITUTE OF FRANCE.** See ACADEMY, FRENCH.

**INSURANCE.** The notable developments of the year in insurance was the rapid adoption of the idea of group insurance by large corporations, the increased ramifications of insurance against all sorts of social and industrial contingencies, and the continued readjustment of rates by some of the large fraternal orders. For the strike of the agents of the Prudential Company, see STRIKES AND LOCKOUTS; see also WORKMEN'S COMPENSATION.

**LIFE INSURANCE.** According to the report of the superintendent of insurance in New York State the total assets of the 37 life insurance companies doing business in that State were \$4,850,000,000 on Dec. 31, 1915. This was an increase of \$214,000,000 over the preceding year. Of the total assets 45 per cent was credited to 12 New York State companies and the remainder to companies of other States and other countries. Among the assets were included bonds and mortgages, \$1,571,



000,000; stocks and bonds, \$2,168,000,000; loans on policies, \$691,259,000; and real estate, \$150,709,000. The capital of these companies amounted to only \$9,889,000, 24 of them being mutual concerns, and the others having small capital sums, except the Prudential with \$2,000,000, the Aetna with \$2,500,000, and the Columbian National, the Provident Life and Trust, and the Pittsburgh Life and Trust with \$1,000,000 each. The surplus of these companies aggregated \$144,670,000; and other special funds, \$109,187,000. Other items of liabilities included reinsurance reserve, \$4,071,403,000; and dividend funds, \$390,764,000. The total income of the 37 companies during 1915 was \$925,732,000. Of this premiums constituted \$684,632,000; and interest and dividends on stocks and bonds, \$211,815,000. The total disbursements were \$713,643,000, of which \$288,288,000 were for death claims; \$113,365,000 for lapsed, surrendered, and purchased policies; \$106,065,000 in dividends to policy holders; \$57,762,000 for commissions; and \$58,356,000 for salaries, medical fees, and wages. The total number of policies in force on Dec. 31, 1915, was 8,288,228, an increase of 438,500 during the year. Total insurance in force was \$15,632,739,000, an increase of \$699,689,000 during the year. It was estimated that the above companies represented fully 90 per cent of the life insurance business of the United States.

**GROUP INSURANCE.** The past few years have seen a very notable development of the insurance of all employees of one employer under a blanket contract known as group insurance. Under this scheme in return for premiums paid monthly by the employer each employee is insured for an amount ranging as a rule from \$500 to \$3000. Customarily expensive medical examination is dispensed with, being in part offset by the more superficial health requirements of employers. The amount of insurance for each employee is based on his individual earnings with the maximum limit above indicated. An individual certificate bearing the name of the employee and his beneficiary is given to each of the insured. New employees are automatically included under the scheme by changes in the premium and outgoing employees are automatically dropped from the list of insured. Such insurance is designed to create good will toward the firm on the part of the working force and is believed to be "good business" by progressive employers, who find that increased loyalty and contentment result in increased output. The cost to the employer approximates  $1\frac{1}{4}$  per cent to  $1\frac{1}{2}$  per cent of the annual payroll, or about \$1 per month for each \$1000 of life insurance. Contracts frequently provide for the payment of benefits in 12 monthly installments in place of one lump sum. Thousands of employees received such insurance certificates as Christmas presents in December, 1916; but there were several instances of employees refusing to accept them on the ground that insurance certificates were being given in place of justly deserved increases in pay.

**Union Pacific Plan.** The most notable instance of group insurance was the plan of the Union Pacific Railroad announced in December. This involved first a wage bonus to all employees (40,000 in number) of one month's pay, except those employed less than one year and those receiving more than \$1800 per year; secondly,

life insurance for 30,000 employees consisting of one year's pay, but not less than \$500 nor more than \$2500, and payable in monthly installments (in case of permanent disability such insurance is convertible into a benefit payable in at least five annual installments); thirdly, accident insurance with payment of half wages for various periods according to the seriousness of the disability; and fourthly, sickness insurance amounting to a maximum of half wages for 52 weeks.

**FIRE INSURANCE.** The average estimated fire loss in the United States and Canada from 1910 to 1915 inclusive was \$225,000,000. This sum was not greatly exceeded in any of these years, though when such disastrous conflagrations as the Chelsea fire of 1908, the San Francisco disaster of 1906, or the Baltimore fire of 1904 occur losses are enormously greater. Three-fourths of the annual loss is believed to be preventable. According to the report of the New York Insurance Department there were 242 fire and fire-marine companies doing business in that State in 1915. Of these 194 were joint-stock companies and 48 mutuals. These companies possessed total assets of \$735,676,000. Stocks and bonds owned were valued at \$522,083,000; real estate, bonds, and mortgages, \$84,687,000; cash, \$59,068,000; and uncollected premiums, \$59,178,000. Among the liabilities of these companies were capital, \$92,698,000; net surplus, \$244,881,000; and unearned premiums of \$331,191,000. Their income totaled \$419,377,000; of this fire premiums amounted to \$342,057,000, and marine and inland premiums to \$28,110,000; interest and dividends, \$27,355,000. Their total disbursements were \$380,552,000, of which \$177,730,000 went for fire losses; \$13,053,000 for marine and inland losses; \$25,276,000 for dividends; \$78,296,000 for commissions; and \$29,225,000 for salaries, expenses, and wages of employees. Of these companies 206 received \$42,468,000 more than they spent, whereas 36 expended \$3,643,000 more than they received. These 242 companies together with 22 companies devoted exclusively to marine insurance covered total risks on Dec. 31, 1915, of \$64,998,000,000. During that year these companies assumed aggregate risks of \$75,494,000,000 for gross premiums amounting to \$643,744,000, an average premium of \$0.85 for every \$100 insured.

The foregoing statistics show that on the whole fire insurance rates are not in general exorbitant, but rather barely large enough to cover losses and expenses under existing methods of conducting the fire insurance business. Many companies were dependent upon interest not only for their entire increase in surplus and reserves, but also to meet part of their losses. The extent of the fire insurance business is only partially indicated by the above statistics, since there are great numbers of small companies not represented in New York State. Moreover, in that State there were 33 advance premium cooperative fire insurance companies with \$153,109,000 insurance in force; 66 county assessment companies with \$328,728,000 insurance in force; and 69 town assessment companies with \$58,529,000 insurance in force on Dec. 31, 1915. See also FIRE PROTECTON.

**CASUALTY, CREDIT, FIDELITY, AND SURETY INSURANCE.** The various forms of insurance included here have grown very rapidly in the United States during the past decade. They

include all kinds of insurance against accidents, business losses, burglaries, workmen's compensation, and other social and business contingencies. The New York Insurance Department report for 1916 showed that the 77 companies in this field in that year had total assets of \$203,303,000. Their capital was \$46,355,000, and surplus \$33,858,000. Other liabilities included reserves for unpaid losses \$42,622,000, and unearned premiums of \$63,367,000. Their aggregate premiums for the year were \$141,411,000, distributed over the following sources: accidents, \$25,745,000; health, \$6,768,000; liability, \$34,306,000; workmen's compensation, \$31,850,000; fidelity and surety, \$22,016,000; plate glass, \$4,687,000; steam boiler, \$3,018,000; burglary and theft, \$4,695,000; automobile damage, \$5,562,000; other minor classes, \$2,753,000. During the year these companies paid claims of \$58,409,000, dividends to stockholders of \$4,960,000, and expenses of \$78,145,000. Twenty-six of them showed an underwriting loss of \$5,098,000, while 51 of them showed an aggregate gain from underwriting of \$4,278,000; there was thus a net loss from underwriting of \$820,000. This, however, was much more than offset by gains from investment operations. Here again the figures are indicative only of the operation of companies doing business in one State; while these include the largest concerns of the country, there are great numbers of similar corporations operating outside of that State.

**FRATERNAL INSURANCE.** An important aspect of life insurance in the United States has been the great popularity of fraternal insurance, in spite of the fact that 50 years' history shows that a large proportion of such organizations sooner or later fail. Such failure has been due primarily to actuarial unsoundness in organization; rates have proven adequate while membership was young and growing rapidly in numbers, but inadequate when members reached more advanced years, a consequently higher death rate, and growth in size was proportionately small. During 1915 and 1916 the Knights and Ladies of Honor was placed in the hands of a receiver; an investigation of the society by the New York Insurance Department was completed in May, 1916. This was the fate also of the New York branch of the Ancient Order of United Workmen. The Royal Arcanum for a second time readjusted its rates in 1905; but a third readjustment was necessary, being announced about December 1st. The increases in rates ranged from 5 cents a month per \$1000 at age 18 to \$2.33 a month at age 65. At age 30 the regular rate per month per \$1000 was increased from 72 cents to 91 cents; and proportionate increases were made up to age 65 where the increase was from \$5.36 to \$7.69 per month. It was expected that from 60,000 to 100,000 members would leave the organization on account of the high rates.

While there are hundreds of these fraternal organizations in the country the 74 large ones represented in New York State showed total assets Dec. 31, 1916, of \$157,251,000; their liabilities were \$24,512,000, their income for the year \$89,417,000, and their disbursements \$78,011,000. Some of the largest of these organizations with the number of their certificates and total insurance in force Dec. 31, 1916, were the following: Supreme Tribe of Ben Hur, 100,018, \$108,128,920; Independent Order of Brith Abra-

ham, 200,142, \$100,071,000; Order of Brith Abraham, 66,367, \$33,183,500; Independent Order of Brith Sholom, 49,870, \$24,519,700; Brotherhood of American Yeomen, 208,169, \$276,851,000; Catholic Mutual Benefit Association, 64,187, \$82,748,000; Catholic Women's Benevolent Legion, 15,917, \$10,542,875; Independent Order of Foresters, 190,125, \$185,994,871; Fraternal Mystic Circle, 16,883, \$16,776,000; French Canadian Artisans' Society, 41,834, \$32,304,202; Improved Order of Heptasophs, 63,336, \$85,842,000; Knights of Columbus, 111,815, \$118,242,443; Knights and Ladies of Honor, 51,740, \$47,600,166; Knights of Pythias, 70,860, \$96,430,990; Ladies Catholic Benevolent Association, 150,900, \$125,766,000; Ladies of the Modern Macabees, 41,749, \$31,014,250; Macabees, 308,561, \$373,243,322; Modern Woodmen of America, 940,225, \$1,499,561,500; National Slovak Society of the United States of America, 40,252, \$29,457,750; National Union, 57,910, \$106,583,500; Order of United Commercial Travelers of America, 73,062, \$365,310,000; Polish National Alliance of the United States of North America, 107,261, \$61,368,600; Protected Home Circle, 92,489, \$79,709,500; Royal Arcanum, 243,095, \$455,120,000; Royal Neighbors of America, 283,911, \$293,037,250; Travelers Protective Association of America, 53,102, \$265,510,000; Woman's Benefit Association of the Macabees, 170,224, \$129,109,926; Supreme Forest of Woodmen Circle, 155,421, \$152,997,600; and Sovereign Camp of Woodmen of the World, 751,058, \$1,007,932,400.

**INSURANCE, INDUSTRIAL.** See WORKMEN'S COMPENSATION.

**INTEMPERANCE.** See ALCOHOL; INSANITY.

**INTERNAL COMBUSTION ENGINES.**

In 1916 few installations of large gas engines were recorded in the United States and comparatively little was heard from Europe on account of the war. In some large steel mills gas engines of usual type were placed and in the new and novel designed power plant of the Ford Motor Company, at Detroit, a producer plant was being built in connection with the immense gas-steam units where every precaution was being taken to recover all waste heat. The completion of this plant was looked forward to by engineers, as it was believed that it would determine the efficiency and status of the producer gas engine as a prime mover, operating as it would, under the most advantageous circumstances. The usual number of gas engines were installed in the natural gas regions. A number of producer plants were constructed, though as regards the latter it was thought that the high price of coal, if sustained, might direct increased attention to this form of prime mover on the score of economy of fuel. The year, however, saw a marked increase in the use of oil engines, and Diesel engines were being manufactured by an increased number of works, including three large shipbuilding plants. The demand for Diesel engines was particularly strong in the South and Southwest and was not restricted to any one line of industry, mines, refrigerating plants, flour mills, pumping and other central stations all using this type of machine in the various sizes in which it was being manufactured. The Diesel engine was finding increased use for marine propulsion (see SHIP-BUILDING) and at the same time an entrance

into this field was being secured for the medium-compression type oil engine, whose makers hitherto had restricted themselves to the stationary form. In all internal combustion engines the standard type seemed to be the four-stroke-cycle engine and but few of the two-stroke-cycle engines which previously had promised to become popular were being built. Of course the most general use of internal combustion engines was in automobile vehicles and there were several features of interest during the year in this connection which are discussed under **AUTOMOBILES**.

**INTERNAL REVENUE.** See **LIQUORS; TOBACCO**.

**INTERNATIONAL CORPORATION, AMERICAN.** This corporation was formed in November, 1915, by leading American financiers under a charter which authorized it to undertake any activity necessary to the development of legitimate business. Working in close cooperation with the National City Bank (New York) which had begun to develop international banking and with the firm of Stone and Webster, building and construction engineers, the Corporation undertook in 1916 a most remarkable series of commercial, industrial, and financial enterprises. During the first year, ending December 1st, there were 1230 propositions submitted to the Corporation relating to developments of various kinds in European countries, South and Central America, China, Japan, and the United States. Its manager, Charles A. Stone, reported net profits of \$2,231,000 for the year. It secured a large interest in the reorganized International Mercantile Marine Company, the great South American firm of W. R. Grace and Company, the United Fruit Company, the Pacific Mail Steamship Company, and the New York Shipbuilding Company. With others it organized the American International Terminals Company to study all kinds of shipping terminals, railway and ocean, throughout the world and to construct the same including warehouses. This corporation was thus a very striking evidence of the new spirit in American business reaching out for a due share of world trade and preparing the way for the investment of large sums of American capital in foreign countries.

**INTERNATIONAL INSTITUTE OF AGRICULTURE.** See **AGRICULTURE**.

**INTERNATIONAL LANGUAGE.** As the war goes on, the idea of the International Language is discussed more and more—from two stand points: Either to hasten reconciliation between the warring nations, or to hold strongly together the nations which fight side by side and which will need a strong bond after the war. There are various projects. On the Entente side: The Chapelier plan, to the effect that English will be required in all schools of French-speaking countries, and French in all schools of English-speaking countries. Its most influential advocate, Michel Bréal, died in 1915; but others took it up; e.g., the well-known writer Ernest Charles, in *L'Opinion* (September 16th): "Pour le Français et l'Anglais, contre l'Esperanto." He answers a pamphlet by H. Muffang, *Langue Internationale, Point de vue national*. Muffang, attacking the Chapelier plan, had maintained, first, that "never would the other nations consent to learn two difficult languages . . . both French and

English are more difficult than Esperanto"; and further that "English being indisputably easier than French, and moreover used by many more people, French would be in a short time outdistanced, and France would before long be only an English province"—this is his "point de vue national." E. Charles answers: If the Allies learn Esperanto, the Germans will soon come to favor Esperanto vigorously in order to kill French and English as international languages; and, later, when they have used Esperanto to kill French and English, they will substitute German for Esperanto. A linguist of note, Dauzat, proposes a somewhat modified form of the Chapelier plan, having in view France especially; namely that two foreign languages be required in secondary schools after the war; one would be English all over France; the other would be German in the east and north; Spanish in the west and southwest; Italian in the southeast; in large cities, the pupils might have the choice between one of the three last named; in Paris and Lyons one might add Russian or Arabic as the second elective.

In England, the following motion, considered on July 20th at the common council, at the Guildhall, London, and proposed for examination to the Board of Trade, sums up the situation: "That in view of the fact that England and the Allies are entering into arrangements for concerted action with regard to future trade matters, it would be of immense value if one language could be recognized as the commercial language, and taught in all schools, here and abroad. By so doing, English, French, Russian, Esperanto, or any other language decided on, would form the basis of communication on business matters throughout the world."

On the other side is Germany: In the conquered provinces, Poland, Alsace, Belgium, they have enforced German as the language of the people. Ostwald, the famous scholar, at one time an Esperantist, but now a defender of Pan-Germanism, has come forward with a proposition that a simplified German be made the international language, the *Welt-Deutsch*.

We may add that in England the British Post Office recognizes Esperanto as a modern European language for telegraphic purposes; while in France, in 1916, it had been decided to forbid for correspondence during the war, such languages not known to the censors, among them any system of shorthand, Hebrew, and Esperanto.

Whether Esperanto is, or is not, used cunningly in an unneutral way by the Germans to prevent national languages of the Allies to prevail as world languages, it is certainly true that many Esperantists have used it for purely humanitarian purposes, and unaware of the help they may unconsciously give the German cause. (See discussion in the *New York Sun*, end of November and beginning of December, between some occasional correspondents.) The 1915 YEAR BOOK has spoken of the work done in Geneva by international committees with the help of Esperanto; in 1915 these people handled 97,415 letters in Esperanto (statistics are not yet available for 1916). Propaganda goes on in the prisoners' camps, civilian and military, in Holland and Saloniki, and probably elsewhere.

The situation is about this: In Russia, the movement was not much disorganized by the war; in Germany, it remained well organized; in France it was most disorganized; in neutral

countries it was also rather deeply disorganized. In Germany they published in Esperanto, almost since the beginning of the war, the official war news, sent to them directly from headquarters; in Germany, also, they used it a great deal to "expose the lies of the Allies"; and in France they answered in it, although not officially. Congresses were held in England and in Switzerland. Remarkable progress has been made since the war in the Far Eastern countries. Several new Esperanto periodicals have been started, both in China and Japan. There had been no real Chinese movement for Esperanto until two or three years ago, and the Chinese Esperanto Association in Shanghai sold in the last year no less than 89,000 textbooks. In Japan, a beginning had been made some years ago, then there had been a slump, then a vigorous start again. In both countries they publish now their own textbooks. Some interesting publications of the year: *Quaker Stronghold*, the well known book by Caroline Stephen, was translated under the title: *Fundamentoj de la Kvakerismo* (by M. C. Butler, of London); in Germany, Friedrich Hebbel's *Gyges kaj lia Ringo*. On the eve of the war, the Esperantists had published B. von Suttner's *Waffen Nieder! : For la Batalilojn*. The translation of the Old Testament by Zamenhof, has been completed, but the manuscript has not yet been taken to England for print, on account of the war.

The cause of Esperanto was helped considerably, although indirectly, by the untimely death of the great scholar, Couturat (automobile accident, early in 1916). Couturat, one will remember, had proposed a plan of reform of Esperanto, and called the improved Esperanto, *Ido*—which had aroused greatly the conservative Esperantists. With him the cause of *Ido* will probably be doomed forever. But his efforts will not have been vain altogether, for it was due to his energetic action, and to the fear of him, that the Esperantists finally were forced to acknowledge that serious improvements could be made on the *fundamento*, or original Esperanto, and agreed to make them gradually. Couturat had completed shortly before his death, the *Dictionnaire Français-Ido* (par. L. de Beaufront et L. Couturat), *Linguo Internacia di la delegataro, Sistemp Idó* (Paris, 1915).

**INTERNATIONAL LAW.** See CONTRA-BAND OF WAR; UNITED STATES AND THE WAR; WAR OF THE NATIONS.

**INTERNATIONAL PEACE AND ARBITRATION.** There was practically no substantial advance toward international peace during 1916 and none toward international arbitration, although these subjects were among those most discussed by the public and press. The various peace and arbitration organizations have been prolific of suggestions and efforts. The continuance of the European war with unabated zeal and violence has, of course, been responsible for this condition of affairs which will undoubtedly continue until a conclusive peace has been agreed upon by all the belligerents. In the meantime there is a difference of opinion among peace workers as to the desirability of maintaining an active propaganda for peace in war times.

**CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE.** The executive committee of the endowment, in its latest report (that of April, 1916), said that it may have seemed to some that ow-

ing to the conditions prevailing in Europe during the preceding year, the endowment would be unable to accomplish the same amount of work as formerly until the return of peace. An examination of the reports of the administrative officers sent to the trustees shows, however, that such is not the real condition. "The secretary has made a somewhat detailed examination of the work in several lines of administration, and a comparison of the work of the year which has just closed with that of the previous year shows a very considerable increase of activities. . . . The division of intercourse and education has, during the year, devoted its labors and funds to the extension of its operations in the United States and South America. The work of the division of economics and history is of such a character that it is not feasible to substitute any considerable amount of exactly similar work in the western hemisphere for the activities interrupted in Europe. Steps have been taken to collect material concerning the war for use in preparing an economic history after its close. . . ."

Recently there has been some public criticism of the trustees for what is described as their inactivity and lack of initiative, in the cataclysm which has overwhelmed Europe and is affecting disastrously all the countries of the eastern hemisphere. In commenting on these facts the executive committee said: "This criticism is reflected also in the endowment's correspondence. Letters are frequently received suggesting that the endowment ought to do this or that; and the suggestion is often accompanied by the assurance that the writer is just the person to undertake it. Every proposition of this character is given careful consideration by the committee; nothing has been suggested in this direction which has seemed to possess practical value for the purpose in view. Moreover, the public criticisms and comments have been singularly lacking in helpful suggestions.

"In so stating, the committee does not wish to be understood as implying any condemnation of the many earnest men and women who have been active and enthusiastic in work which has for its purpose the arousing of public feeling to the horrors of war, and interesting the people in methods whereby it is hoped that their recurrence may be limited or prevented. Many organizations for that purpose have sprung up throughout the United States, independent of the existing societies which have long been working in this field; most of these have their own particular plan, programme, or panacea, by which the organizers think it possible to accomplish the end in view; some of them are solicitous for the coöperation and financial assistance of the Carnegie Endowment, and unable to understand why it is not instantly granted.

"Three reasons why may be stated, already familiar to those who read the *Year Book* of the endowment. First, the endowment deems it wise to do its work through organizations with long-established records for usefulness and efficiency. Second, the endowment is largely engaged, directly and effectively, in peace propaganda, through its division of intercourse and education. Third, it is clear that a concentration of effort in this field, through well organized and well officered organizations, is a wiser

policy than the indiscriminate encouragement of new societies, many of them ephemeral in character, and some of them organized for the exploitation of views and proposals on the subject of international peace which do not commend themselves to the judgment of the trustees of the endowment.

"A common criticism directed against the endowment takes the form of the questions: What is the endowment doing to stop the European war? and, What is the endowment doing to see to it that other wars do not follow the present one?"

"The answer is obvious. The endowment has taken no steps to stop the European war. Its trustees recognize the fact that a private organization is not in a position to take any such steps, with any possibility that any useful results can follow. No private organization, by whomsoever organized and officered, is in any such position; and therefore the endowment has extended no financial assistance to any group of men or women organized for that purpose. The determination of these matters is primarily in the hands of the governments of the belligerent nations. None of them has been or is in a frame of mind to tolerate such interference, or to regard it as other than an impertinence. The terms and conditions of that peace depend entirely upon the outcome of the war. No human being can foresee what that outcome will be. The basis of the peace will be determined by events which time alone can develop. Then, again, it is well known that the Government of the United States has sounded the belligerents and offered its good offices, and it is obviously not the function of a private organization to compete with the government.

"In this connection, and as the endowment's answer to the criticisms directed against it, the committee can not do better than to quote from the statement issued by the trustees under date of Feb. 16, 1915, and widely circulated at that time. What was said in this statement remains as true to-day as when written. It still represents and explains the attitude of the endowment:

"We wish to say to all friends of peace that the dreadful war now raging affords no just cause for discouragement, no discredit to past efforts, and no reason to doubt that still greater efforts in the future may be effective and useful.

"The war itself is teaching the gospel of peace through a lesson so shocking and so terrible that the most indifferent can not fail to attend and understand it.

"Not only have the destruction of life, the devastation and the suffering in the warring countries passed all experience, but the cessation of production, the closing of markets, the blocking of trade routes, the interruption of exchanges, have affected industry and caused ruin and poverty in all the peaceful countries of the world.

"The universal interdependence of nations has been demonstrated and the truth forced upon every mind that the peace of all nations is the vital concern of every nation.

"To cast our weak protest now among the tremendous forces that are urging on the great conflict would be futile; but the end of this war will come before long, and then the great question will stand for answer:

"Shall the lesson be forgotten; the sacrifice lost?"

"That question the belligerent nations only will have the power to answer; but every one in the world will be entitled to be heard upon it, for it will be a question of civilization, the most momentous of our era.

"It seems incredible that after this the stricken people will set their feet in the same old paths of policy and suspicion which must lead them again to the same result.

"Finding expression through a great multitude of voices everywhere the general public opinion of mankind should influence the minds of the negotiators who settle the terms of peace and inspire them to a new departure in the establishment of justice as the rule of international relations.

"While we must not be overconfident of our individual qualifications to point out the detailed methods through which the result may be accomplished, we may still advocate measures which seem practicable and appropriate to the purpose.

"We can see that definite rules of national conduct should be agreed upon; that a court of competent jurisdiction should be established to judge of national conformity to those rules; and that new sanctions should be provided to compel respect for the judgments rendered.

"Above all the motive and spirit of the new institutions should be clearly and fully not the promotion of ambition or the extension of power, but the safeguarding of human rights and the perfection of individual liberty.

"Toward this high end the courage and hope and conviction of the humblest citizen of the most distant land may contribute."

LEAGUE TO ENFORCE PEACE, WORLD'S COURT LEAGUE, WORLD PEACE FOUNDATION. These and sundry other organizations have been unremitting in their efforts to advance the particular objects of their organizations. The programmes of the first two named are identical in several respects.

The League to Enforce Peace favors a league of nations to secure: (1) A judicial tribunal for all justiciable questions not settled by negotiation; (2) an international council of conciliation; (3) conferences of signatory powers from time to time, to formulate and codify rules of international law valid unless vetoed by some signatory power within a stated period; (4) joint use of economic forces against a signatory power which refuses to submit any question to court or council before committing hostilities; joint use of military forces against a signatory which actually begins war before such submission.

The World's Court League favors a league among nations to secure: (1) An international court of justice for all justiciable questions not settled by negotiation; (2) an international council of conciliation in addition to the Permanent Court of Arbitration at The Hague; (3) world conferences meeting regularly at shorter intervals than heretofore, to establish the court and council, to formulate and codify rules of international law valid for all nations which approve them; (4) a permanent continuation committee of the world conferences with such powers as the conferences may grant.

The distinguishing difference between the two lies not in the objects they are seeking, but in

the methods to be used to secure the adoption of these objects. Neither body is trying to stop the present war. The League to Enforce Peace concedes that no human agency can prevent all wars, any more than a police force, however efficient, can suppress all crime. It would, however, use combined moral, economic, and military power against any member-nation that commits an act of war against another member without first submitting its grievance to tribunal or council and awaiting complete examination. It proposes to abolish secret diplomacy, which has brought on so many wars, substituting therefor delay and public discussion, because it believes that nations are like men: the longer they talk the less likely they are to fight.

Both of the national parties and their candidates endorsed the principles of the league, as did the Chamber of Commerce of the United States, President Wilson, ex-President Taft, and Viscount Grey, while serving as British foreign secretary. In an address before the Foreign Press Association (October 23rd) Viscount Grey said:

"I believe the best work neutrals can do for the moment is to try to prevent a war like this happening again. If nations had been united by such an agreement, and had been prompt and resolute to insist in July, 1914, that the dispute be referred to a conference or to The Hague, and that the Belgian treaty be observed, there would have been no war.

"The belligerent countries are fighting for their existence. There are daily increasing prospects of seeing victory brought nearer, but still, knowing that if they stop short of victory they stop short of everything for which they have been struggling, they cannot be expected to spend much time thinking about what might happen after the victory is secured. But neutrals can.

"I observe that not only President Wilson, but also Mr. Hughes, the other candidate for the presidency, is supporting the league, which was started, not with the object of interfering with the belligerents in this war, but with the object of establishing an international association after the war is over which will have its part in making peace secure in the future.

"Although we have little time to give ourselves while engaged in this struggle, it is a work for neutral countries on which we all look with favor and hope. Only we must bear this in mind, that if the nations after the war are able to do something effective in binding themselves to the common object of preserving peace, they must be prepared to undertake not more than they are able to uphold by force and to see to it when the time of crisis comes that it is upheld by force. The question we must ask them when the time comes is:

"Will you play up when the time comes?"

"It is not merely the sign manual of presidents that will really make that worth while. There must also be behind it the parliaments and the national sentiments. The object of this league is to make treaties be kept and further resorts tried before war. Before the war started in 1914 there was no such league. Supposing the conditions of 1914 occur again and there is such a league in existence. Everything will depend upon whether the national sentiment behind it is so penetrated by the les-

sons of this war as to compel each nation as a vital interest to keep the peace."

On November 9th the German Chancellor, von Bethmann-Hollweg, declared in the Reichstag:

"We have never concealed our doubts with regard to the question whether peace could be permanently guaranteed by such international organizations as arbitration courts. I shall, however, at this place not discuss the theoretical aspects of the problem, but we must now and at the time of the conclusion of peace from the point of view of facts define our position with regard to this question. When at and after the end of the war the world will become fully conscious of its horrifying destruction of life and property, then through the whole of mankind will ring a cry for peaceful arrangements and understandings, which, as far as lies in human power, shall avoid the return of such a monstrous catastrophe. This cry will be so powerful and so justified that it must lead to some result. Germany will honestly cooperate in the examination of every endeavor to find a practical solution of the question, and will collaborate to make its realization possible. This all the more, if the war as we expect and trust, will create political conditions, which do full justice to the free development of all nations, the small ones as well as the great nations. Then it will be possible to realize the principles of justice and free development on land and of the freedom of the seas."

In commenting on this in a message sent to Rev. Charles S. Macfarland, the general secretary of the Federation of Churches of Christ in America, Prof. Adolf Deissmann of the University of Berlin, one of the signers of the statement on the part of the intellectuals issued at the beginning of the war, which was also signed by Harnack, Eucken, and Haeckel, said:

"The above is not the private opinion of an individual, but the voice of our leading statesmen. The echo which this straightforward address, so full of strength and national dignity, has found in our press, confirms my impression, that the idea of arbitration is constantly gaining ground in our country. Nov. 9, 1916, will therefore not only be a memorable day in the history of our country but also a landmark in the history of humanity. Our geographical position compels us to consider the question soberly and not to surrender to sentimental dreams, for now as always self-defence is our sacred duty. But just because we are a powerful nation we are at all times ready and willing to come to an honorable understanding.

"Of course, if attempts to form an international alliance for maintaining lasting conditions of peace are to be practically realized, the mental and spiritual atmosphere within the great powers must change. The gangrenous ulcer of hate, which poisons international relations, must be burnt out and the intellectual heads of nations, above all the Christian leaders, must under full recognition of the bona fides of their opponents, be ready to forgive one another's thoughts as well as words and deeds, whereby they have hurt and wounded each other. Then they would be able to succeed in fully entering into the problem of reconstruction. In creating this atmosphere, which is prerequisite to every step towards a better mutual understanding, neutral Christians have a great mission. Without pharisaism and by the proper

attitude which avoids everything that might pour oil on the flames of war, they should regard combatants as suffering brethren, nurse their wounds and reconsider the attitude of their hearts and minds."

Prof. Ellery C. Stowell of Columbia University published in *The Nation* (December 7th) an extended argument pointing out the danger of the proposed league as contrasted with the advantages of using and extending the present machinery of arbitration provided by The Hague Tribunal.

Samuel T. Dutton, formerly of Columbia University, and organizer of the New York Peace Society, has been made general secretary of the World's Court League, and Frank Chapin Bray editor of *The World Court*, its official organ.

In this latter publication, James Brown Scott of the Carnegie Foundation and special adviser to the Secretary of State, urged the calling of a third Hague Conference on the conclusion of the war, to which every country belonging to the society of nations shall be invited and in whose proceedings every such country shall participate; he also advocated a stated meeting of the Hague Peace Conference which, thus meeting at regular, stated periods, will become a recommending if not a law-making body. In his opinion, a legislature or parliament in the national and ordinary sense of the term cannot be created for nor be accepted by the society of nations, without a radical reorganization of the society of nations, difficult and time-consuming, and perhaps impossible to bring about. A frequent and stated meeting of the Hague Conference, which is a legislature *ad referendum*, that is, a diplomatic and recommending body, will accomplish much the same result, as the conventions and declarations adopted by the conference and submitted to the participating nations for their careful examination and approval become, as Dr. Brown pointed out, at one and the same time, upon ratification by the nations and the deposit of ratifications thereof at The Hague, national laws and international statutes. The process is indirect between nations instead of direct as within nations; the form is different, but the effect the same. He also suggested an agreement of the states forming the society of nations concerning the call and procedure of the conference, by which that institution shall become not only internationalized, but in which no nation shall take as of right a preponderating part; and further to request the appointment of a committee, to meet at regular intervals between the conferences, charged with the duty of procuring the ratification of the conventions and declarations and of calling attention to the conventions and declarations in order to ensure their observance. He also advocated the creation of an international council of conciliation.

Another of the peace foundations restricting its activities during the war is the World Peace Foundation (40 Mt. Vernon Street, Boston). Another reason for this curtailment has been the foundation's active and vigorous support of the programme of the League to Enforce Peace. The trustees of the foundation as a body are convinced that the league's programme embodies the most hopeful and feasible set of reforms likely to be realized in international fields following the war, and, with that conviction have done everything in their power to bring this

programme to the attention of the American public. The foundation has assisted by grants of money, assignment of staff, provision of office quarters, and the issuance and distribution of publications.

There has been no sacrifice of the foundation college and general educational work. It organized, and contributed to the expenses of, the Conference on International Relations held at Western Reserve University, Cleveland, Ohio, June 21st to July 1st. The foundation sustained the monthly *International Polity News*, the organ of the Federation of International Polity Clubs, but this work has now been relinquished to the American Association for International Conciliation. The foundation's regular activity of distribution of peace literature and the dissemination of accurate information has continued in increasing proportion throughout the year.

On December 27th, Edward Cummings, general secretary of the foundation, issued a statement respecting President Wilson's note of December 18th to the belligerent powers, in which he asserted that the significance of the President's move lay in the official offer by the United States to take a part in a League to Enforce Peace after the war.

The Sixth National Conference of the American Society for Judicial Settlement of International Disputes was held at Washington, December 8th-9th. The usual number of publications were issued during the year.

AMERICAN ASSOCIATION FOR INTERNATIONAL CONCILIATION (407 West 117th Street, New York). This organization continues its policy of publishing the more important documents relating to the present European war, proposals of peace, and addresses having for their object the promotion of a more friendly feeling among nations. Those printed during 1916 were published in a bound volume in 1916. Those issued during this year included: *America's Opinion of the World War*, by Eduard Bernstejn, translated by John Mez; *International Coöperation*, by John Bassett Moore; *The Outlook for International Law*, by Elihu Root; *Documents Regarding the European War*, Series No. XII: "Statement of Measures Adopted to Intercept the Sea-Borne Commerce of Germany," presented to Both Houses of Parliament by Command of His Majesty, January, 1916; *Great Britain's Measures Against German Trade*, a speech delivered by the Rt. Hon. Sir E. Grey, Secretary of State for Foreign Affairs, in the House of Commons, on the 26th of January, 1916; *German White Book on Armed Merchantmen*; *Speech of Imperial German Chancellor before the Reichstag, on April 5, 1916*; *The Proposal for a League to Enforce Peace*, affirmative, William Howard Taft, negative, William Jennings Bryan; and a long series of special bulletins.

FEDERAL COUNCIL OF THE CHURCHES OF CHRIST IN AMERICA. At its quadrennial meeting (December 6th-11th) in St. Louis, the Federal Council pledged itself afresh to the cause of "world peace through world justice." The name of the Commission on Peace and Arbitration was changed to the Commission on International Justice and Goodwill. The report of the commission (400 pages) is a record of many accomplishments and gives promise of work for the future. The closing section called

to the churches to cooperate in the instruction and inspiration of Christian citizens, and their guidance in methods of constructive activities. "World peace can come by no mechanical or merely political contrivance. It will come only as an expression of character and good sense."

The Quadrennial Council endorsed the movement and work of the World Alliance for Promoting International Friendship through the Churches, and urged each of its 30 affiliated denominations that had not already done so, to establish a commission to cooperate with the alliance, at the same time instructing its commission to cooperate in every practicable way with the American Council of the World Alliance. The council further "urgently recommended each local congregation to establish at once its 'peace makers committee' and to take up during the winter the important activities proposed for such committees in the education of our citizenship in their responsibilities for more effectively Christianizing America's international relations and policies."

**EPISCOPAL CHURCH.** At the General Convention of the Episcopal Church held in St. Louis on October 17th, the following resolution was adopted:

"Whereas, Present conditions call for a clearer recognition of the Christian principles of the brotherhood of men; the practice of righteousness and good will between nations as between individuals; the substitution of judicial processes for war in the settlement of international disputes; and the embodiment of these principles in national policies and laws, not merely as an abstract ideal, but as a practical conviction for whose development the Christian churches have special responsibility; therefore be it

"Resolved, That a commission be appointed consisting of 10 bishops appointed by the chairman of the house of bishops, and 10 presbyters and 10 lay communicants appointed by the president of the house of deputies, with power to fill vacancies and to add to their number, whose duty it shall be to promote the spread of the desire for peace in the world and international friendship, and to relate their operations to the World Alliance for Promoting International Friendship through the Churches to that end."

**NATIONAL ECONOMIC LEAGUE** (6 Beacon Street, Boston). The league published two reports on the most practicable means of promoting peace, and subsequently devoted an issue of its magazine to a discussion of the conditions and problems after the war.

**UNITED NATIONS.** In a pamphlet entitled "Constitution of the United Nations of the Earth," Edgar D. Brinkerhoff (Fall River, Mass.) has with great ingenuity drawn up a "Constitution of the United Nations of the Earth," somewhat on the lines of the Constitution of the United States of America, the aim of this being to secure peace by a union of all nations. This Parliament of the United Nations is to consist of a senate and a "duma"—to have the power to levy taxes, to borrow money on the credit of the United Nations when necessary, or provide for an "efficient" standing army and navy, and to declare war on nations outside of the union. There are provisions for a currency of the central government, but it is not compulsory on any

dominion to use this currency internally. Each nation is free to choose for itself between a monarchic and republican government. Under one section of the "constitution" nations are represented in the lower house according to population. Russia is to have 55 members, France 32, Germany 25, the British Empire 143, and the United States 36. The central government is not left dependent upon any national government for contributions of men, arms, or money. This "constitution" defines treason as levying war against the United Nations or adhering to their enemies, and the disqualification of all senators or "dumaists" by rebellion.

**AMERICAN INSTITUTE OF INTERNATIONAL LAW.** On Jan. 6, 1916, the Institute adopted a declaration of principles which are themselves based upon decisions of English courts and of the Supreme Court of the United States.

1. Every nation has the right to exist and to protect and to conserve its existence; but this right neither implies the right nor justifies the act of the state to protect itself or to conserve its existence by the commission of unlawful acts against innocent and unoffending states. (Chinese Exclusion Case, 130 U. S. 581, 606; Regina vs. Dudley, 15 Cox's Criminal Cases, p. 624, 14 Queen's Bench Division 273.)

2. Every nation has the right to independence in the sense that it has a right to the pursuit of happiness and is free to develop itself without interference or control from other states, provided that in so doing it does not interfere with or violate the rights of other states.

3. Every nation is in law and before law the equal of every other state belonging to the society of nations, and all nations have the right to claim and, according to the Declaration of Independence of the United States, "to assume, among the powers of the earth, the separate and equal station to which the laws of nature and of nature's God entitle them." (The Louis, 2 Dodson 210, 243-44; The Antelope, 10 Wheaton 66, 122.)

4. Every nation has the right to territory within defined boundaries and to exercise exclusive jurisdiction over its territory and all persons whether native or foreign found therein. (The Exchange, 7 Cranch 116, 136-7.)

5. Every nation entitled to a right by the law of nations is entitled to have that right respected and protected by all other nations, for right and duty are correlative, and the right of one is the duty of all to observe. (United States vs. Arjona, 120 U. S. 476, 487.)

6. International law is at one and the same time both national and international; national in the sense that it is the law of the land and applicable as such to the decision of all questions involving its principles; international in the sense that it is the law of the society of nations and applicable as such to all questions between and among the members of the society of nations involving its principles. (Buvot vs. Barbuit, Cases Tempore Talbot, p. 281; Triquet vs. Bath, 3 Burrow, p. 1478; Heathfield vs. Chilton, 4 Burrow 2015; The Paquete Habana, 175 U. S. 677, 700.)

**NEUTRAL CONFERENCE FOR CONTINUOUS MEDIATION.** This conference was formed as a result of the Ford Peace party of 1915-16, and though wholly unofficial, is in some real degree representative. According to Emily Green Balch who was the sole American present at its meet-



ings held during 1916 at Stockholm, Sweden, delegates were present from six neutral countries. In Switzerland, Holland, Sweden, Norway, and Denmark national committees served as the constituencies and the agents of this central committee. Only the United States delegates have had, as it happens, no such support. Consequently the character and work of the conference were quite naturally, according to Miss Balch, much less understood in America than in Europe. Efforts to get Spanish representation failed, owing to war-time difficulties of travel and communication.

The first phase of the conference, in which the national delegations were set at five each, lasted from the middle of February to the middle of April and was mainly occupied with formulating two appeals, one to neutrals asking for the calling of an official conference, the other to the belligerents proposing specific peace terms for a just and reasonable settlement. This "Appeal to Governments, Parliaments, and Peoples of the Belligerent Nations" was at once published, and also personally submitted to the Stockholm representatives of the belligerent governments. Not only did the neutral press print this in full, but Austria, Germany, Great Britain, Italy, and Russia permitted its appearance, and the French-Swiss press gave it at least some access to France. The national delegations were subsequently reduced to two each.

In the opinion of many students and publicists one of the most important developments during 1915-16 has been the influence of the European war upon Pan-American solidarity, commerce, and friendship. No international event since the declaration of the Monroe Doctrine in 1823 has done more to bring about a true appreciation of Pan-American interdependence than the European conflict. Likewise it is believed that the great Pan-American Scientific Congress which assembled in Washington last December-January (INTERNATIONAL YEAR BOOK, 1915, p. 334) under the auspices of the Pan-American Union, of which John Barrett was secretary-general, was undoubtedly one of the most important international gatherings ever held on the western hemisphere. There were in attendance more official delegates than have participated in any other Pan-American conference, and it opened the way to strengthening friendly relations through education, sciences, art and literature, as well as through commerce and opportunity.

The Pan-American Union itself, as the great international official organization of the 21 American republics, has done more than ever before in its history to advance the best interests of each and all of the republics and to cement the closest ties of friendship and trade.

**INTERNATIONAL HIGH COMMISSION.** Another important event was the meeting of the International High Commission at Buenos Aires in April. This was attended by official delegates from all the American republics, who adopted many resolutions for the working out of closer official and commercial relations. The committee reports and resolutions have been published by order of the central executive council by the American government. The permanent organization of the commission was provided for in the following resolution:

*Resolved,* That, the sections of the several participating countries continue until the next

meeting of the International High Commission. Each section shall consist of nine members, of whom the minister of finance shall be chairman. It shall select a vice-chairman from among its number, and a secretary, who may or may not be a member of the section;

That a central executive council be constituted whose duty it shall be to centralize and coordinate the labors of the commission, to keep the several sections in constant touch with one another, to carry out the conclusions of the International High Commission and the Pan-American Financial Conferences, and to prepare the programme, reports, and all other material necessary for the holding of the second meeting of the International High Commission:

That the above mentioned central executive council consist of a president, a vice-president, and a secretary of the section of the country which may be selected as the seat of the said central executive council, and act until the next meeting of the International High Commission. All expenses incurred by the central executive council shall be borne by the country in which it shall be established;

That the central executive council submit to the various sections a draft of the proposed rules of procedure, and all observations and communications relating thereto be transmitted by the central executive council to each section, in order that the said rules of procedure may be approved at the next meeting of the International High Commission;

That the next meeting of the International High Commission be not held until two years from this date. It shall be held thereafter upon request from at least five sections. The place and date of meeting shall be fixed after all the sections have been consulted, and shall be determined by a majority vote. As soon as these points have been decided, the call for the meeting shall be issued by the central executive council;

That the various sections may be represented at the meetings of the International High Commission by delegations of not more than five members each appointed by the respective governments. The presiding officer of the meetings of the International High Commission shall be the minister of finance of the country in which the meetings shall be held.

Another resolution dealt with the subject of the next Pan-American Financial Conference:

*Resolved,* That it is highly advantageous that a Pan-American Financial Conference of the character of that held in Washington in 1915 meet every two years; that the next Pan-American Financial Conference take place in 1917 in Washington, the exact date to be agreed upon subsequently among the various governments on the initiative of the central executive council of the International High Commission; that the ministers of finance of all the countries of the American continent be urged to attend in view of the fact that the financial questions there to be discussed constitute the most important problems of these conferences, and in view also of the fact that the presence of these ministers is conducive to the more effective carrying out of the resolutions adopted.

**INTERSTATE COMMERCE COMMISSION.** See RAILWAYS, *Valuation.*

**INTERSTATE GRAND OPERA COMPANY.** See MUSIC, *Opera.*

**IOWA. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 2,220,321. The population in 1910 was 2,224,771.

**AGRICULTURE.** The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture in 1915-16, were as follows:

	Acreage	Prod. Bu.	Value
Corn . . . . . 1916	10,050,000	366,825,000	\$298,460,000
1915	9,950,000	298,500,000	152,285,000
Wheat . . . . . 1916	660,000	10,450,000	16,802,000
1915	950,000	18,985,000	16,517,000
Oats . . . . . 1916	5,050,000	186,850,000	89,688,000
1915	4,950,000	198,000,000	63,860,000
Potatoes . . 1916	115,000	4,830,000	8,452,000
1915	120,000	12,600,000	8,804,000
Hay . . . . . 1916	8,600,000	5,796,000	52,164,000
1915	8,500,000	6,800,000	54,810,000
Rye . . . . . 1916	55,000	985,000	1,075,000
1915	60,000	1,110,000	888,000
Barley . . . 1916	295,000	8,702,000	7,919,000
1915	275,000	8,525,000	4,177,000

a Tons.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments . .	5,528	5,614
Average number of wage earners . . . . .	61,685	68,118
Capital invested . . . . .	\$171,219,000	\$233,127,000
Wages . . . . .	32,542,000	39,860,000
The value of materials used .	170,707,000	205,451,000
The value of products . . . .	259,298,000	310,750,000

**MINERAL PRODUCTION.** The coal production of the State in 1915 amounted to 7,614,143 short tons, valued at \$13,577,608, which represents an increase of 163,121 tons in quantity, and \$213,538 in value. The number of men employed in the coal mines of the State decreased from 16,057 in 1914 to 15,549 in 1915.

The coal production of the State in 1916 is estimated at 7,900,000, an increase of about 4 per cent over the production in 1915. The coal produced in Iowa is nearly all used in the State, or is consumed by railroads.

**EDUCATION.** The school population of the State in 1915 was 678,192. There were enrolled in the public schools 522,423, with an average daily attendance of 391,131. There were 24,163 female teachers, and 2628 male teachers. The average monthly salary of male teachers was \$89.17, and of female teachers \$54.07. The total expenditures for education during the year amounted to \$18,704,972. See also **UNIVERSITIES AND COLLEGES.**

**FINANCE.** There was a balance on hand on July 1, 1915, of \$856,045. The receipts for the year were \$8,946,045, and the disbursements \$8,648,265, leaving a balance on hand on June 30, 1916, of \$717,825. The chief sources of revenue are the State tax, motor tax, and receipts from State offices. The chief expenditures are for State schools and for institutions. The State has had no bonded debt since 1892.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions of the State are as follows: Soldiers' Home, Soldiers' Orphans' Home, Clarinda State Hospital (insane), Mount Pleasant State Hospital (insane), Independence State Hospital (insane), Cherokee

State Hospital (insane), School for the Deaf, Institution for Feeble-Minded Children, State Sanatorium for Treatment of Tuberculosis, Industrial School for Boys, Industrial School for Girls, State Hospital and Colony for Epileptics (this institution has not yet been opened to receive patients), State Hospital for Inebriates, State Penitentiary, the Reformatory, Women's Reformatory (institution not yet opened). The total population of these institutions on June 30, 1916, was 9611. The expenditure for their maintenance was \$4,664,789.

**TRANSPORTATION.** The total mileage of main track in the State in 1916 was 9924. This includes interurban lines. Railroads having the longest mileage were the Chicago, Burlington, and Quincy, 1365; the Chicago Great Western, 769; the Chicago, Milwaukee, and St. Paul, 1867; the Chicago and Northwestern, 1610; the Chicago, Rock Island, and Pacific, 2202.

**POLITICS AND GOVERNMENT.** Political interests in 1916 began early on account of the candidacy of Senator Cummins for the Republican nomination for President. A presidential primary was carried by him without opposition, and the State delegation was instructed to vote for him at the convention. Following the presidential primary, interest centred in the primary election for the nomination of party candidates for State offices. For the Democratic nomination for Governor E. F. Meredith of Des Moines had no opposition, although he reversed the historical attitude of his party upon the question of the control of the liquor traffic. He announced that he was for prohibition, and forced a plank to that effect into the Democratic State platform. For the Republican nomination for Governor there was a quadrangular contest, which was won by Lieut.-Gov. W. L. Harding, of Sioux City. The contest between Meredith and Harding developed many bitter controversies. While the apparent issue related to the question of the control of the liquor traffic, Harding having been opposed to prohibition, the determining factor was the attack of the contest on road improvement. Meredith was forced into a position in the public view of being a candidate who stood for paved roads, and the issuance of bonds to build them, although in fact this was not the programme to which he or his supporters were committed. Harding became the candidate of those who erroneously believed that Meredith stood for hard road and bond issues. The liquor issue was practically lost sight of.

The presidential race was submerged in the bitterness of the State contest. Few meetings were held either for Hughes or Wilson. The speeches of the contest were devoted almost entirely to the State campaign. At no time was it believed that Wilson would carry the State, as the Progressive Republicans, who had supported Roosevelt in 1912, had returned to the Republican party.

The result of the election demonstrated the accuracy of this estimate. On the national ticket the Republican vote was won by its normal plurality, while Harding carried the State by twice the plurality given to Hughes. The rest of the Republican State ticket was elected by a plurality even larger than that for Hughes, and the Legislature is Republican by nearly 100 majority on joint ballot. This is significant of the fact that the Legislature for 1914

voted to submit to popular vote a prohibitory amendment and that proposition comes before the Assembly in 1917. Both party platforms pledged candidates to vote for it. The vote for President was: Wilson 221,669, Hughes 280,499, Benson 10,976, and Hanly 9371.

On March 1st, the anti-tipping law of the State was declared unconstitutional by Judge Jepson in a decision rendered in the District Court at Sioux City. The decision was based on the case of a barber arrested for accepting a tip.

**STATE OFFICERS.** Governor, William L. Harding; Lieutenant-Governor, E. R. Moore; Secretary of State, William S. Allen; Treasurer, William C. Brown; Auditor, Frank S. Shaw; Attorney General, H. M. Havner—all Republicans.

**JUDICIARY.** Supreme Court: Frank R. Gaynor, supreme justice; Horace E. Deemer, Scott M. Ladd, William D. Evans, Benjamin I. Salinger, B. W. Preston, Silas M. Weaver, judges; B. W. Garrett, clerk—all Republicans.

**LEGISLATURE.** Republicans, House, 94, Senate 40, on joint ballot, 134. Democrats, House 14, Senate 10, on joint ballot 40. Republican majority, House 80, Senate 30, joint ballot 90.

**IOWA, STATE UNIVERSITY OF.** A State co-educational institution at Iowa City, Iowa, founded in 1847. The total registration in all departments in the autumn of 1916 was 3500. The faculty numbered 298. During the year President Thomas H. Macbride retired, becoming president emeritus, and was succeeded by Walter A. Jessup, who had been dean of the College of Education of the university since 1913. The productive funds of the institution amount to about \$429,200 and from all sources an income of \$1,319,656 was obtained in the last year. The library possesses 125,000 volumes. See UNIVERSITIES AND COLLEGES.

**IPEIGÉNIE EN TAURIDE.** See MUSIC, *Opera*.

**IRELAND.** A large island west of Great Britain; a part of the United Kingdom of Great Britain and Ireland. See GREAT BRITAIN.

**IRIGOYEN, HIPÓLITO.** See ARGENTINA.

**IRON AND STEEL.** The iron ore mined in the United States in 1915 amounted to 55,526,490 gross tons, compared with 41,439,761 gross tons in 1914, an increase of 14,086,749 gross tons, or 34 per cent. The quantity of iron ore shipped from the mines in 1915 amounted to 55,493,100 gross tons, valued at \$101,288,984, compared with 39,714,280 gross tons, valued at \$71,905,074, shipped in 1914. This is an increase in quantity of 15,778,820 gross tons or 40 per cent, and in value of \$29,383,905 or 41 per cent. The average price of iron ore per ton in 1915 was \$1.83, compared with \$1.81 in 1914. Domestic iron ore sold for the manufacture of pig iron amounted in 1915 to 55,475,887 gross tons, valued at \$101,261,528, compared with 39,671,603 gross tons, valued at \$71,790,094, in 1914.

Iron ore was mined in 23 States in 1915, compared with 27 in 1914. Of these States, Idaho, Nevada, and Utah produced ore for fluxing only. Part of the production of California and Colorado was for smelter flux, and part for pig iron and ferro alloys. The remaining States produced for blast furnace use only, except small quantities for sale from Georgia, Michigan, New York, Pennsylvania, and Wisconsin. The States producing the largest quantity of iron ore in the order of production, are as follows: Minnesota, Michigan, Alabama, Wisconsin, and New York. New York was the only one of these States that produced less than 1,000,000 tons in 1915, and it fell little short of that mark. The iron ranges of Minnesota produced more iron ore than all the rest of the States combined, having furnished 60 per cent of the total for the United States in 1915. The Lake Superior districts, comprising all the mines of Minnesota, Michigan, and those in northern Wisconsin, mined 46,944,245 tons, or 85 per cent, compared with 33,540,203 gross tons, or 81 per cent, in 1914. The following tables show the iron ore mined in the United States in 1914 and 1915 by States, and varieties, with a percentage of increase or decrease in 1915.

1914

State	Hematite	Brown ore	Magnetite	Carbonate	Total quantity
Alabama	3,902,567	936,392			4,838,959
California			1,282		1,282
Colorado		10,464			10,464
Connecticut		9,149			9,149
Georgia	11,836	55,886			67,722
Kentucky	21,400				21,400
Maryland		6,369			6,369
Massachusetts		7,600			7,600
Michigan	10,796,200				10,796,200
Minnesota	21,946,901				21,946,901
Missouri	32,054	5,500			37,554
New Jersey			850,185		850,185
New Mexico			81,980		81,980
New York	49,704		785,678		785,377
North Carolina			57,667		57,667
Ohio				5,188	5,188
Pennsylvania	8,300	28,560	379,466		406,326
Tennessee	202,330	123,884	4,000		330,214
Virginia	66,904	311,616			378,520
West Virginia		6,580			6,580
Wisconsin	886,512				886,512
Wyoming	866,962				866,962
Other States <sup>a</sup>		40,800			40,800
	88,286,670	1,587,750	1,610,208	5,188	41,439,761

<sup>a</sup> Idaho, Mississippi, Montana, Nevada, and Utah.

1915

State	Hematite	Brown ore	Magnetite	Carbonate	Total quantity	Percentage of increase or decrease in 1915
Alabama	4,374,309	985,045			5,309,354	+ 10
California			646		646	50
Georgia	16,505	99,196			115,701	+ 71
Maryland		5,500			5,500	+ 14
Massachusetts		3,950			3,950	48
Michigan	12,514,516				12,514,516	+ 16
Minnesota	33,464,660				33,464,660	+ 52
Missouri	85,145	5,145			40,290	+ 7
Nevada		3,998			3,998	(a)
New Jersey			415,234		415,234	+ 19
New Mexico			84,806		84,806	58
New York	b 71,207	(b)	927,638		998,845	+ 27
North Carolina		857	65,596		66,453	+ 15
Ohio				8,455	8,455	38
Pennsylvania	(c)	c 22,552	840,757		363,309	11
Tennessee	181,509	100,469	2,207		284,185	14
Virginia	88,506	d 309,536	(d)		348,042	8
Wisconsin	1,095,388				1,095,388	+ 24
Wyoming	484,518				434,518	+ 13
Other States e		d 23,650	(d)		23,650	- a 69
	52,227,324	1,488,709	1,807,002	8,455	55,526,490	+ 34

a Less than three producers in Colorado and Connecticut in 1915 and in Nevada in 1914, and permission was not granted to publish State totals. Increases and decreases in 1915, therefore, included in "Other States."

b Brown ore included in hematite.

c Hematite included in brown ore.

d Magnetite included in brown ore.

e Colorado, Connecticut, Idaho, and Utah.

There were in 1915 184 iron ore mines active, compared with 164 in 1914. These mines produced more than 50,000 gross tons of iron ore each, and seven produced more than 1,000,000 tons of iron ore each. The first place in 1915 was held by the Mahoning mines in Hipping, Minn., second place by another mine adjoining this, and third by the Red Mountain group, Bessemer, Ala.

While the European war was undoubtedly the cause for the increase of production of iron ore, there was also much additional activity in industries in the United States which employ iron in large quantities. One industry which requires a large quantity of iron and steel, which was extremely active during 1915, was shipbuilding.

IMPORTS AND EXPORTS. The quantity of iron ore imported in 1915 was 1,341,281 gross tons, valued at \$4,181,645. This was a slight decrease over the importations of 1914. Of the ore imported Cuba produced approximately 60 per cent of the amount, and the remainder came from Sweden, Chile, Canada, and Spain. There were exported in 1915, 707,641 gross tons, valued at \$2,181,629, compared with 551,618 gross tons, valued at \$1,794,193, in 1914, an increase in quantity of about 28 per cent and in value of about 22 per cent.

WORLD PRODUCTION. The following table gives the world's production of iron ore as far as statistics are available:

IRON ORE PRODUCED IN PRINCIPAL COUNTRIES, 1911-1915, IN GROSS TONS

Country	1911	1912	1913	1914	1915
<b>North America:</b>					
Canada a	187,807	192,753	274,678	218,620	355,457
Cuba a	1,163,714	1,397,797	1,582,431	821,110	827,448
Newfoundland	1,171,992	1,251,968	(b)	(b)	(b)
United States	43,876,552	55,150,147	61,980,437	41,439,761	55,526,490
<b>South America:</b>					
Chile	28,150	6,349	(b)	(b)	(b)
<b>Europe:</b>					
Austria-Hungary	4,779,851	4,997,311	5,018,109	(c)	(b)
Belgium	148,130	164,784	(b)	(b)	(b)
France	16,376,967	18,858,668	21,572,835	(b)	(b)
German Empire and Luxemburg	29,408,812	33,180,258	d 26,771,598	(b)	(b)
Greece	498,106	424,835	305,195	294,573	(b)
Italy	367,900	572,900	593,618	695,124	(b)
Norway	217,051	401,665	77,693	(b)	(b)
Portugal	19,233	28,947	48,407	(b)	(b)
Russia	(e)	(b)	(b)	(b)	(b)
Spain	8,635,523	f 8,990,743	9,708,866	(b)	(b)
Sweden	6,056,868	6,595,044	7,357,845	6,482,904	(b)
United Kingdom	15,519,424	13,790,391	15,997,328	14,867,583	(b)
<b>Asia:</b>					
China g	109,542	201,561	269,748	(b)	(b)
Chosen (Korea)	96,902	121,224	(b)	(b)	(b)
India	366,190	580,224	370,845	441,674	(b)
Japan	(h)	(h)	(b)	(b)	(b)
Philippine Islands	216	347	546	392	(b)

Africa:	Country	1911	1912	1913	1914	1915
	Algeria .....	1,057,087	1,171,252	(b)	(b)	(b)
	Madagascar .....	(f)	22	(b)	(b)	(b)
	Togoland .....	894	(b)	(b)	(b)	(b)
	Tunis .....	897,688	470,866	(b)	(b)	(b)
Australia .....		122,861	113,989	(f)	(f)	(k)

a Shipments.  
 b Statistics not available.  
 c Statistics not available. Bosnia and Herzegovina produced 176,014 gross tons.  
 d Germany alone. Figures not available for Luxemburg.  
 e Russia produced 3,536,417 gross tons of pig iron in 1911 and 4,181,890 tons in 1912.  
 f Includes 1568 gross tons argentiferous iron ore, value \$8307.  
 g Exports.  
 h Japan produced 52,228 gross tons of pig iron in 1911 and 55,379 tons in 1912.  
 i Madagascar produced 1.5 tons of iron (metal) in 1911.  
 j Queensland produced 40,838 gross tons and South Australia 60,658 tons in 1913; in 1914, Queensland, 48,090 and South Australia 42,622 tons.  
 k Queensland produced 45,686 gross tons.

It will be noted that comparatively small amounts are credited to other countries than the United States in 1915.

PIG IRON. The production of pig iron of all kinds in 1915 was 29,190,213 gross tons, compared with 23,332,244 tons produced in 1914, an increase of about 28 per cent. The following table gives the production of pig iron in the United States in 1914-15 by States:

more prosperous than the preceding year. In the first five months the shipment of ore from the Lake Superior region was more than 10,000,000 gross tons, or 83 per cent greater than the corresponding period for 1915. Ore prices in the lower lake ports for 1916 were increased 75 cents a ton over those for the season of 1915. The production of coke and anthracite pig iron in the first five months showed an in-

PIG IRON MANUFACTURED IN THE UNITED STATES IN 1914 AND 1915, IN GROSS TONS a

1914		1915	
State	Quantity (gross tons)	State	Quantity (gross tons)
Pennsylvania .....	9,733,869	Pennsylvania .....	12,790,668
Ohio .....	5,288,426	Ohio .....	6,912,962
Illinois .....	1,847,451	Illinois .....	2,447,220
Alabama .....	1,826,939	New York .....	2,104,780
New York .....	1,559,864	New Jersey .....	
New Jersey .....		1,557,855	Alabama .....
Indiana .....	829,526		Indiana .....
Michigan .....		271,228	Michigan .....
Wisconsin .....	267,777		Wisconsin .....
Minnesota .....		236,893	Minnesota .....
Virginia .....	216,738		West Virginia .....
Missouri .....		195,594	Kentucky .....
Colorado .....	6,594		Mississippi .....
California .....		23,332,244	Missouri .....
West Virginia .....	29,916,218		Colorado .....
Kentucky .....		217,729	California .....
Mississippi .....	7,802		Maryland .....
Tennessee .....		7,802	Virginia .....
Maryland .....	7,802		Tennessee .....
Massachusetts .....		7,802	Connecticut .....
Connecticut .....	7,802		Massachusetts .....

a Bureau of statistics of the American Iron and Steel Institute. Includes some ferroalloys.

The number of blast furnaces in operation on Dec. 31, 1914, was 445. Of these, 156 were in Pennsylvania. The imports of pig iron in 1915 amounted to 89,836 gross tons, compared with 138,903 in 1914, a decrease of 35 per cent. The largest amount came from the United Kingdom. There were exported in 1915, 224,509 gross tons, a decrease of about 96 per cent over the exports of 1914. The largest quantity was sent to Italy.

STEEL. The production of steel in the United States in 1915 amounted to 8,287,213 ingots and castings of bessemer steel, and 23,679,102 ingots and castings of open hearth steel. The production of steel by the electric process amounted to 69,412 gross tons. The manufactured iron and steel imports into the United States in 1915 amounted to 191,066 gross tons, valued at \$5,956,377. There were imported 3,308,097 gross tons, valued at \$137,347,782, compared with 1,330,644 tons, valued at \$55,467,657, in 1914.

The iron and steel industry in 1916 was even

crease of 66 per cent over that corresponding period for 1915, and the prices ranged from \$5 to \$7.25 per ton higher.

The production of iron ore in 1916, according to estimates made at the end of the year, was the greatest in the history of the iron mining industry. The shipments of iron ore from the mines during the year were about 75,500,000 gross tons, compared with 55,493,100 in 1915. This ore sold for \$178,935,000, an increase of over \$77,000,000 compared with 1915. The production of pig iron made a record in 1916, with a total of over 139,000,600 gross tons, compared with 29,190,213 tons in 1915. Of the total shipments of iron ore 64,734,198 gross tons were shipped by boat from the Lake Superior district. The shipments of iron ore from all other important iron mining districts showed increases ranging from 3.2 to 49 per cent. See also CHEMISTRY, INDUSTRIAL; FINANCIAL REVIEW: METALLURGY.

IRRIGATION. Largely on account of the

war the year 1916 was one of stagnation in the undertaking of new irrigation enterprises. In the Western Hemisphere both Canada and Mexico, the two countries having the most interest in the extension of irrigation, outside of the United States, were involved in war or revolutions, while in the Eastern Hemisphere most of the nations ordinarily engaged in reclamation work were also engaged in war. The progress of the year in different parts of the world is summarized below:

**UNITED STATES.** There was little new construction of irrigation works in the United States during 1916, such as there was being limited to work on United States reclamation projects and other projects previously begun, and a few comparatively small irrigation districts. The practical cessation of desert reclamation work led to a great deal of discussion of possible methods of financing reclamation and colonization schemes. The opinion was expressed very generally that the advance in the cost of irrigation works per acre served, had become so great that it would be necessary for future reclamation schemes to receive some form of public aid if they were to succeed, and that settlers on such land must be aided also. The extension of the time for payment of water-right charges under the government projects, provided for in 1915, was in effect a heavy subsidy, but it did not seem to be sufficient to enable persons with small capital to successfully take up land on the government projects. The reclamation fund created by existing law was about exhausted, and unless provision was made for increasing the fund in other ways new work under the reclamation service was practically at an end. Aside from government agencies, the "irrigation district" was receiving the most attention as a means of carrying on reclamation work. Under this plan lands susceptible of irrigation from a common system of works may be organized into a district which has power to issue bonds to obtain funds with which to purchase or construct the works necessary to provide a water supply for irrigation, and to levy and collect taxes to pay interest and principal on bonds and the cost of operation and maintenance.

Laws for the organization and operation of such districts had been in existence for many years and many districts had been organized, but these districts had not been successful in meeting their obligations, in all cases, and consequently there was little market for their bonds. Recent legislation and much proposed legislation had for its purpose the strengthening of the district scheme in order that bonds might be salable. Several of the Western States had made district bonds legal investments for certain classes of funds, and had provided for rigid State examination and supervision of plans for districts. The guaranteeing of district bonds by the State was being urged by many, and a bill was introduced in Congress providing for the guaranteeing of these bonds by the United States in cases where the plans were approved by the Secretary of the Interior and the works were built under his supervision. As a step in this direction Congress passed a law providing that government lands might be included in irrigation districts and become subject to district taxes, with the provision, however, that the taxes levied against such land

should not be paid by the United States, but should be charged against the land and be collected from the entryman when the lands were taken up.

Various plans for aiding settlers on irrigated lands were being urged but no definite policies had been clearly formulated. Government or State advances for equipment and stock with long periods for repayment and low rates of interest were being urged, but had not yet been provided for either by the States or the national government. A notable feature of the year was the turning over of the Imperial Valley (California) irrigation system to an irrigation district. This is the largest irrigation enterprise in the United States, comprising about 500,000 acres.

The annual report of the United States Reclamation Service for the year ended June 30, 1916, showed total estimated receipts from the sale of public lands credited to the reclamation fund, amounting to \$90,388,331.61, to which should be added a loan from the treasury of \$20,000,000, making the total reclamation fund \$110,388,331.61. Of this there had been expended up to June 30, 1916, \$102,151,456.07. The area included in the government projects on that date was 3,117,862 acres, to 1,690,244 acres of which the Service was prepared to furnish water for the season of 1916. The area covered by water-right applications and rental agreements—that is, the area for which the landholders had entered into agreements of some kind to pay water-right charges—was 1,307,810 acres, and the acreage to which water was supplied in 1916 was 856,778 acres, an increase of about 50,000 acres over the preceding year. The Service was prepared, therefore, to furnish water to 833,462 more than was irrigated, an area just about equal to that irrigated.

Under an order of the Secretary of the Interior, dated Nov. 22, 1915, the administration of the Reclamation Service was reorganized by reducing the number of members of the reclamation commission from five to three, the three retained being the director and chief engineer, the chief counsel, and the comptroller. The office of chief of construction was provided for, this officer having charge, under the director, of all construction and maintenance work, with headquarters in Denver. The board appointed in 1915 by the Secretary of the Interior to fix the costs of projects to be paid by the water users, has reported on a few of the projects.

Operations under the Carey Act (Act of Aug. 18, 1894, granting desert lands to the States on condition that the States provide for their reclamation), were small during the year 1916, as for several years previous. During the year ending June 30, 1916, there were applied for under this law areas aggregating 218,337 acres, and there was patented to settlers an area of 160,741 acres. The total area segregated to the States under this law since its passage, is 3,077,912.69 acres, and the total area patented to settlers is 761,455.30 acres.

Many State legislatures did not meet in 1916, and consequently there was no irrigation legislation. The act of Congress providing for the inclusion of government lands in irrigation districts has been mentioned.

**OTHER COUNTRIES.** Western Canada was in

much the same situation with reference to irrigation as was the United States. Water had been provided by the Canadian Pacific Railway for large areas not yet utilized, and the principal activity in irrigation was devoted to the settlement of this land. Efforts were made by settlers to be relieved from paying the portion of the purchase price of their lands representing the charge for irrigation, on the ground that the land did not need irrigation, but these efforts have not been successful.

Projects for the irrigation of large areas in Mexico were being urged, but the unstable conditions in that country prevented progress on these projects.

Notwithstanding the war there was considerable irrigation construction in progress in Italy, principally for storage of water. In Sardinia a dam 180 feet high was under construction. This dam was to create a reservoir with a capacity of 280,000 acre-feet. Another dam, in Apulia on the Bradano, was to be 200 feet high, and would provide for the storage of about 300,000 acre-feet; another dam, on the Fortore, was to be about 250 feet high and would provide a storage capacity of 300,000 acre-feet; and still another, on the Simeto in Sicily, would provide for the storage of 250,000 acre-feet. A large canal under construction near Grosseto, in Central Italy, on the Ombrone, had for its purpose the silting up of a large area of marsh land, and the irrigation of this land after it had been raised. The Italian government subsidized such works to an extent amounting to paying about 35 per cent of the cost, and it was proposed to increase the amount of such subsidies.

In the Canary Islands, the municipality of Santa Cruz, on the Island of Teneriffe, completed in August, 1916, an irrigation system comprising two long tunnels and a canal, for the watering of about 5000 acres of banana-bearing lands.

In South Africa, in the Sundays River district, near Port Elizabeth, it was proposed to erect a dam for storing water for the irrigation of 38,000 acres of land to be devoted to citrus fruits.

The Turkish government was proceeding with its plans for irrigation in Asiatic Turkey. In addition to its plans for irrigation from the Tigris and Euphrates rivers, begun a few years previously, it had undertaken a project for the irrigation of the Adana Plain, at a cost of nearly \$20,000,000, to serve nearly 500,000 acres of land which would be devoted to cotton, sugar cane, citrus fruits, and olives. This region is traversed by the Bagdad Railway and would have water transportation also.

The Egyptian ministry of public works, which had been experimenting with cotton in the Sudan for several years, issued a report favoring the storing of water on the White and the Blue Niles for cotton irrigation. Works were under construction, and it was considered possible to double the cotton acreage in Egypt.

The Siamese government entered upon the construction of the "Prasak" scheme of irrigation. This scheme involved the eventual reclamation of about 2,400,000 acres of waste land in lower Siam, for rice culture, at a total expense of some \$50,000,000. The plans, however, contemplated only the beginning of this

project. American engineers were in charge of the work and American machinery was being used in construction.

In Australia both Victoria and New South Wales were proceeding with their state irrigation projects and the settlement of the lands under them. See **AQUEDUCT; DAMS; FLOODS AND FLOOD PREVENTION.**

**ISOSTASY.** See **GEOLOGY, Isostasy.**

**ISTRIA.** A crownland of Austria, consisting of a peninsula in the Adriatic Sea and forming a part of the administrative district of Kärntenland. It contains the important naval base and seaport of Pola. The area is 1914 square miles; population in 1910, 403,566.

**ITALIAN LITERATURE.** In the 1914 **YEAR BOOK** we noted the Crocian movement in criticism and aesthetics as perhaps the solitary example of a marked Italian influence upon literary activities outside of Italy (Croce having a considerable following in Germany, England, and America), if we exclude the still fluid and inconsistent pressure of the Futurists. The **YEAR BOOK** has, since 1913, sought the explanation of this restricted popularity of Italian literature abroad in the special conditions of contemporary Italian culture which that literature reflects: nationalism (romantic historicity), regionalism, and Catholic idealism (sentimentality). Prof. Vittorio Racca in the *Colonnade* (New York, 1916) has written an interesting criticism of this point of view, breaking a lance in favor of Italian nationalism as a literary motive at once honorable and of universal appeal.

We regret our inability to range the name of Vilfredo Pareto, the Swiss-Italian economist, alongside of that of Benedetto Croce. There is little evidence that in the din of the war the sane and unbiased voice of Pareto is being heard. Pareto first came into prominence for his criticism of the century-old theory of the unequal distribution of wealth, pointing out the failure of political economy to have given any precise indication of what an "equal distribution of wealth" would be, going on thence to establish the law of wealth fluctuations and distribution. With an equally incisive thought he has attacked both the Marxian theory of war (economic interest) and the various official books of diplomatic records, exhausting the colors of the rainbow, which present the different national "justifications." If Pareto does not claim that the nations are fighting to actuate no real objects, he does hold that those objects are wrongfully stated, willfully confused. War is, for him, the result of national animosities sustained by national "myths and dogmas," which have an oratorical, a literary value, but are devoid of scientific, "experimental" worth. One of the most brilliant disciples of Pareto is Maffeo Pantaleoni, a visitor to America in 1913. We suggest Pantaleoni's article on the Monroe Doctrine, in the *Vita Italiana*, an important organ of youthful and vigorous Italian thought, as a typical specimen of Paretan criticism of international politics. This article is to appear in translation through the Carnegie Foundation. Those who recall the brilliant essay of Guglielmo Ferrero on *Poland, the Thorn in the Flesh of Germany*, written, we believe, as early as 1897, need find nothing new in Pareto's method, the novelty of which consists largely in stress and systematic development of certain principles of so-

ciology. Decidedly the war-book of the year has been the second edition of Preziosi's *La Germania alla conquista dell' Italia*, a work also of the Paretan tradition. It traces, through the directorships of the principal Italian financial houses, the growth of German power not only in Italy, but in Spain, South America, France, England, Russia, and the Orient, not through expenditure of German capital, but through control of local savings. Its character as an anti-neutrality pamphlet does not destroy the scientific value of this work, which is not without some interesting implications concerning American finance.

A dash of Pareto, a dose of Marinetti, mixed with a hatred of Hegel and Croce, a return to mysticism and reaction almost as rabid as the swing to socialism of 10 years ago, much conceit, some real sensibility, an insufferable brilliancy of epigram, an erudite misinformation, go to make up the present mental state of the most distinctive group of young litterateurs in Italy. The high priest of this group is still Giovanni Papini, the first Italian "pragmatist," one of the first "new nationalists," a later convert to futurism, now the inexhaustible, the tireless exponent of "the three greatest conquests of the contemporary spirit: pure lyricism, pure plasticism, pure speculation" (*La paga del sabato*, p. 200). Papini is convinced that Italy is the most intelligent nation in the world, and then, that Papini is the most intelligent man in Italy. He wastes much time proving, in nearly all his articles, this second thesis. For the rest, he writes little that does not contain at least some new idea, some penetrating reflection. His style is tense and furious, punctuated at points of special violence with little obscenities and oaths. "My mission on earth is, I believe, identical with that of the devil in the vast universe of the Lord God. I must deny, rebel, lead men to evil, hurl them into the hell of the unsatisfying particular, with contempt for the paradise of unity and order" (*L'altra metà*, p. 11). This group has many of the earmarks of the exaggerated romanticism of just a century ago. Like that ancient movement it is probably on the road to somewhere, without being fully conscious of its goal. Its organ is *La Voce*, where can be found from Soffici a development of the æsthetic theory of "wonderment" (*meraviglia*), samples of literary criticism (on Pascoli, for example, or Salvatore di Giacomo), specimens of poetry and romance. Or read the *Avventure spirituali* of Emilio Settemelli, or the *Prologhi* of Vincenzo Cardarelli, or the preface of De Robertis to the *Esame di coscienza di un letterato*, of Renato Serra, killed at Podgora in July, 1915. The arch-enemies of this school—but who in their blessedness hear not its chatter—are D'Annunzio and Croce. But are not these antitheses more imaginary than real? The exponents of pure lyricism may recall that Croce was the first to insist on the absolute distinction between logic (narrative, etc.) and intuition (lyricism). And the exponents of "wonderment" find their genealogy reaching back through the later aspects of D'Annunzio to the seventeenth century of Marino.

D'Annunzio, in whose ointment of the "sagra di Quarto" many a fly has become stuck since May, 1915, has published a beautiful symphony of patriotic, mystic, sentimental motivation in

the long *Licenza to La Leda senza oigno* (see YEAR BOOK, 1913), now appearing in three volumes. *L'Altare* of Sem Bennelli, "The Altar," is the "radiant vale of Vipacco, with its undulating hills, on which the people of Italy, in priestly garb, has sacrificed its sons to the Eternal Mother, to place the ring of Italy on the finger of Trieste" (pp. 4-5). Cesare Battisti, editor of *Tridentum* of Trent, was wounded and captured at Vallarsa, and hanged for treason in July. His last publication was a lecture entitled *Gli Alpini*. The works which exploit less directly or incidentally the war spirit, are legion. *Le spie* of Giuseppe Marcotti, for instance, harks back to Risorgimento days for some rather faded melodramatic effects of love and danger. Francesco Pastonchi has lost none of the exquisite delicacy with which years ago in *Fiamma* he clothed the wild passions of Sardinia. His *Campo di grano* suggests the healthy yearning for peaceful labor in the fat fields over which the war has swept in vain. The other tales in that collection enter preferably the traditional Italian spirit of sentimental gloom. *L'Amante lontano* of Roberto Bracco turns his favorite theme of feminine idealism into a similar channel: Mirrella is loved by Luciano and Michele; the heroic death of Luciano at the front renders her union with Michele forever impossible. A war hero figures also in Bracco's *Uocchie consacrate* (in Neapolitan dialect).

The volume of the fruitful poetic year is, as it was bound to be, some new *Poesie* of Salvatore di Giacomo (Ricciardi, Naples). After the death of the venerable interpreter of Sicily, Luigi Capuana, appeared his volume of tales *Dalla terra natale*, and a play *Quaquarè*. Keeping still to the authors of established fame, we note of Pirandello three comedies, *Ceodè*, *Pensaci Giacomino*, and *Se non così*; from Antonio Beltramelli, the regionalist of Romagna, *La sementa* (tales); from Luciano Zuccoli, *La volpe di Sparta*, and *Novelle prima della guerra*; from Grazia Deledda, *Le vie del male* (romance). The *Scampolo* of Dario Niccodemi is a rather hasty working of a theme of some potentiality: the wild, homeless, but honorable girl of the streets, coming under the awakening influence of adolescent love to a naïve vision of elegant life in a world far above her fortunes. Sabatino Lopez, the president of the Italian Authors' Association, has added to his dozen works for the theatre two comedies, *Per te solo* and *Mario e Maria*. There is some deep poetry in the work of an author who signs himself as Prince Ughetto di Cupi, entitled *Il postremo dolore, memorie del Marchese Marco di Roargo*. We indicate the *Ore calle? Sonetti romaneschi* of Augusto Sindici (Sinnici) to those who love the wonderful earnestness of *Villa gloria*, or the pathetic sparkle of *La scoperta dell' America* of Pascarella.

OTHER WORKS. *Verse*: G. Cena, *Homo*; C. Cordaro, *Canti di guerra*; E. Gerunzi, *Poemi del mistero*; M. de Leone, *Sonorita*; G. Ravegnani, *Io e il mio cuore*; G. Galatiello, *Intima varia* (in Latin); G. Donati Petteni, *Versi dorati*; A. Cerqua, *Povere muse*; A. Ippoliti, *Ave Patria*; Dante Dini, *Voci nell'Alba* (for children); G. Melli, *Marmi ed inni*; P. Reina, *Salve Italia*; L. Castagno, *L'ultimo capestro*; Margherita Califano, *Versi*; L. Dario de' Tuoni, *Dall'esilio*; V. L. Fraticelli, *La veglia tra gli*



*oleandri* (rhythmic prose); B. Montale, *Foglie cadute*; Lia Gullo, *La fioritura*; Augusta Mosconi, *Verso le porte d'Italia*. *Novels*: Alfredo Panzini, *La madonna di Mamà*; Marino Moretti, *Il sole del sabato*; Guido da Verona, *Mimi bluette, fiore del mio giardino*; D. A. Meduri, *Le sconfitte dell'ideale*; G. J. Fabbri, *Chi è senza peccato*; Carlo Dadone, *Ninetto Bardì l'avventuriero* (for children); B. Sperani, *Ricordi della mia infanzia* (for children). *Tales*: G. Pecchio, *Ah quei mandolinisti*; Carmela Fiorentino, *Sempre l'amore*; Maria Botti, *La neve e le tenebre*; G. Fanciulle, *Il castello delle carte*; Carlo Dadone, *Come presi moglie*; A. Avancini, *All'ombra del faggio*; Rosso di San Secondo, *Ponentino*; Renato Baldani, *Giorni di Silvano* (noteworthy). *Translations*: Oscar Wilde, *L'amore e le donne* (Vallardi); from Spanish, Alvarez-Quintero, *Le memorie di Don Rodrigo*; *Il fiore d'Andalusia*, *Lettatura*, *Anima malata* (Beccari-Motta); G. Benavente, *Mal querida*; into English, Pellico, *Francesco da Rimini* (A. O'D. Bartholeyns). *Drama*: F. A. Carbonaro, *Stefania* (tragedy); L. Chiarelli, *La maschera e il volto*; A. Benedetti-L. Doria, *Colui il quale*; S. Savarino-R. del Tindaro, *Suo padre*; Nino Martoglio, *U rifanti* (in Sicilian dialect); C. Bertolazzo-R. Barbiera, *I fratelli Bandiera*; F. Saba, *Scorci di vita*; E. Scarpetta, *Tutti catalettici and La lega dei mariti*; G. Gianantoni, *Isabella d'Este*; E. Murolo, *Pasqua in famiglia*; G. Forzano, *Pape Satan* (anti-German satire); F. M. Martini, *Il fanciullo che cade*, and *La vipera*; E. Pettinelli, *Il magistrato* (prize winning comedy, Rome); Viola-Antonelli, *L'ombra*; G. Antona-Traversi, *Il sopravissuto*; A. Novelli, *Pollo freddo and Il lupo eretico il vizio*; A. Ricchetti, *N. H. Kan-Kan*; Enrica B. Gentilli, *Mio zerman*; G. M. Sierra, *La canzone della cuna*.

**NECROLOGY.** Ferruccio Benini, actor, interpreter of Goldoni and Gallina; Giuseppe Pitré, Sicilian folklorist; Bonaventura Zumbini, critic and scholar; Ugo Bolzani, historian, medievalist; Domenico Gnoli, critic, littérateur; Tommaso Salvini, famous tragic actor.

**ITALIAN PHILOLOGY. See PHILOLOGY, MODERN.**

**ITALIAN SOMALILAND.** An Italian colony in eastern Africa, bordering the coast of the Indian Ocean. Estimated area, 357,000 square kilometers (about 137,800 square miles). Estimated population, 300,000. In 1914-15, imports were valued at 7,166,329 lire, and exports at 1,611,318. For 1915-16 the estimated revenue was 6,669,000 lire; estimated expenditure, 6,569,190 lire. The dependency is administered by a governor, resident at Mogadiscio.

**ITALY.** A southern European constitutional monarchy, composed of the Apennine Peninsula, the islands of Sicily and Sardinia, and a number of minor islands. The peninsula is traversed throughout its length by the Apennine chain; the Alps divide it from France on the north. Italy is a member of the Entente Alliance in the European war. Capital, Rome.

**AREA AND POPULATION.** In the following table are given, by compartimenti, the area in square kilometers (according to the calculation of the Military Geographical Institute), the number of provinces in each compartimento, the population as taken at the census of June 10, 1911, and the population as estimated Jan. 1, 1915:

	P.	Sq. km.	1911	1915
Piedmont .....	4	29,367	3,424,450	3,508,626
Liguria .....	2	5,278	1,197,281	1,269,506
Lombardy .....	8	24,085	4,790,478	4,996,325
Venetia .....	8	24,547	3,527,860	3,732,941
Emilia .....	8	20,701	2,681,201	2,809,187
Tuscany .....	8	24,105	2,694,706	2,787,765
The Marches .....	4	9,712	1,093,253	1,133,265
Umbria .....	1	9,709	686,596	714,682
Rome .....	1	12,081	1,802,424	1,887,846
Abruzzi e Molise .....	4	16,529	1,430,706	1,480,748
Campania .....	5	16,295	3,811,990	3,426,754
Apulia .....	3	19,109	2,180,151	2,237,791
Basilicata .....	1	9,962	474,021	489,574
Calabria .....	3	15,075	1,402,151	1,471,780
Sicily .....	7	25,789	3,672,258	3,793,465
Sardinia .....	2	24,109	852,407	880,868
<b>Total .....</b>	<b>69</b>	<b>*286,682</b>	<b>34,671,337</b>	<b>36,120,118</b>

\* 110,688 square miles.

The communal population of Naples, as estimated Jan. 1, 1915, was 697,917, Milan 663,059, Rome 590,960, Turin 451,994, Palermo 345,891, Genoa 300,139, Florence 242,147, Catania 217,389, Bologna 189,770, Venice 168,038, Messina 150,000, Leghorn 108,585, Bari 109,218, Padua 105,135, Ferrara 102,550, Brescia 89,622, Verona 86,448, Foggia 79,213, Ravenna 74,161, Modena 76,584, Perugia 70,227, Pisa 67,285.

The number of marriages in 1914 was 252,187; living births, 1,114,091; stillbirths, 47,615; deaths exclusive of stillbirths, 643,355. Emigrants in 1914 numbered 479,041, of whom 233,144 went overseas and 245,897 to the European countries or other countries on the Mediterranean.

**INDUSTRIES.** Of the total area (about 70,800,000 acres), about 51,300,000 acres are classed as productive and over 11,200,000 are forested. The rich soil yields fruits in abundance. Wine is produced in quantities for consumption and export. From Tuscany, Liguria, and the Province of Bari comes olive oil. In the table below are to be found area under main crops and production, for consecutive years:

	1000 acres		1000 cwts.	
	1914	1915	1914	1915
Wheat .....	11,921	12,649	92,230	92,825
Barley .....	617	615	3,012	4,812
Oats .....	1,228	1,222	7,788	9,128
Rye .....	306	298	2,672	2,216
Corn .....	3,934	3,933	53,346	61,860
Rice .....	365	360	10,894	11,212
Beans .....	1,584	1,352	6,402	9,498
Potatoes .....	735	734	1,668	1,545
Sugar beets .....	102	125	1,350	1,480
Vines .....	11,803	11,041	947	419
Olives .....	5,746	5,750	39	88

Sericulture is carried on throughout the country, particularly in Piedmont and Lombardy. The quantity of eggs placed for hatching in 1913 was 300,000 hectograms, producing 32,000,000 kilograms of cocoons. The production for 1914 was 46,668,000 kilograms.

Among the principal minerals are iron, lead, zinc, copper, manganese, and antimony ores, sulphur, gypsum, amianthus, alum, and boracic acid. Silver is found in Sardinia, and some gold in the Alps. Salt is a government monopoly. Following are the productive mines in operation and the output in metric tons in 1914, the value in lire of the output, and the number of workers:

Ores, etc.	No.	M. tons	Ltrs	Workers
Iron	25	706,246	16,227,168	2,059
Manganese	6	1,649	54,721	158
Copper	7	86,958	1,648,608	888
Zinc	97	48,538	9,114,859	14,006,171
Lead				
Gold	1	206	111,858	48
Antimony, argenti-ferous	2	555	87,825	75
Mercury	8	119,228	8,815,186	900
Iron and cuprous pyrites	11	835,581	7,883,958	2,486
Mineral fuel	46	781,338	7,848,267	4,070
Sulphur ore	324	2,371,705	29,063,211	15,747
Asphaltic and bituminous substances	19	120,179	2,188,588	1,142
Boric acid	7	2,587	1,040,170	501
<b>Total *</b>	<b>605</b>		<b>96,517,918</b>	<b>44,165</b>

\* Including other.

Employed in the quarries in 1914 were 67,818 persons, and the output was valued at 81,277,096 lire.

In the fishing industry, 28,820 boats, with a tonnage of 79,915, were employed Dec. 31, 1913; persons engaged, 141,371; value of total catch in home waters, 19,939,000 lire, of which 2,397,000 lire from the tunny fisheries and 535,000 from coral fisheries.

COMMERCE. A decree of Nov. 13, 1914, provided that merchandise, the exportation of which is prohibited, cannot be re-exported to foreign countries in process of transit or transshipment if it has arrived in an Italian port with bills of lading indicating Italy as the original destination, or if there is no clear indication of destination. For this purpose, consignments provided with bills of lading to order not having inscribed in the body of the document the name of a non-Italian destination, and those provided only with bills of lading to bearer, will be considered as destined for consumption in Italy. By decree of June 10, 1915, the export of all foodstuffs was prohibited. By decree of Sept. 2, 1915, raw cotton was declared contraband of war. The decree of Sept. 15, 1915, introduced an export tax for rice and other cereals in special cases, where the export is permitted (by the decree of Aug. 1, 1914). The imports for consumption and exports of domestic produce—merchandise, and coin and bullion—are given below for three years (values in lire):

Imports	1909	1911	1913
Mdse.	3,111,710,447	3,889,298,000	3,637,771,000
C. & B.*	18,000,800	28,896,500	21,014,000
<b>Total</b>	<b>3,129,711,247</b>	<b>3,418,194,500</b>	<b>3,658,785,000</b>
Exports	1909	1911	1913
Mdse.	1,866,889,562	2,204,927,000	2,503,914,000
C. & B.*	54,067,700	42,091,900	80,287,000
<b>Total</b>	<b>1,920,957,262</b>	<b>2,247,018,900</b>	<b>2,584,201,000</b>

\* Includes all precious metals.

A British source gives totals for 1914 as follows: Imports, merchandise, £116,933,902, C. & B., £1,079,216; exports, merchandise, £88,416,167, C. & B., £796,932. Detail of the 1914 trade follows:

Imports	1000 lrs	Exports	1000 lrs
Cereals	224,989	Raw silk	583,562
Coal and coke	386,681	Cotton mfra.	130,997

Imports	1000 lrs	Exports	1000 lrs
Raw cotton	316,512	Silk mfra.	107,015
Machinery	121,686	Fruits, dried	184,055
Timber	109,486	Wines	85,814
Raw silk	71,195	Cheese	68,266
Iron, etc.	85,531	Hemp (raw)	67,371
Wool, etc.	119,445	Hides	45,048
Coffee	48,717	Eggs	52,580
Instruments	72,827	Sulphur	27,745
Hides	96,168	Flour	84,535
Iron scrap	22,987	Pulp of wheat	30,981
Silk mfra.	38,812	Yarn, etc.	41,456
Fish	51,515	Automobiles	36,685
Tobacco	31,944	Fresh vegetables	21,237
Oil seed	85,554	Hats	26,889
Copper, etc.	89,308	Rubber mfra.	62,828
Rubber mfra.	54,921	Olive oil	32,981

The more important countries of origin and destination follow, values in thousands of lire:

Imports		Exports	
1914	1915	1914	1915
508,185	155,749	Germany	319,148
504,934	487,873	U. K.	305,712
442,847	1,238,070	U. S.	262,462
205,535	177,983	France	174,193
238,815	84,107	Austria-Hungary	196,711
189,838		Russia	88,160
39,878	328,078	Argentina	115,924
151,495		British India*	50,419
55,518		Belgium	30,881
76,901	88,167	Switzerland	281,889
85,802		Turkey	67,689

\* With Ceylon.

COMMUNICATIONS. For the financial year 1914-15 the Italian treasury was compelled to make up a deficiency of approximately \$4,000,000 in the net receipts of the state railways. This covers a period before Italy entered the war, but her railways were affected by the reduced commerce, and by the high prices of coal and material, as well as by the suspension of navigation in the Adriatic, and the absence of tourists. Railroad freight rates in Italy during 1916 were raised 10 per cent so as to secure money to pay extra wages of the railway employees, totaling \$4,000,000, which were granted after complaints of the high cost of living and the extra work entailed by reason of the war. It was hoped the government revenues would be increased by \$3,000,000 annually.

FINANCE. Revenue and expenditure are given in lire in the table below for three financial years (1914-15 subject to revision):

	1912-13	1913-14	1914-15
Revenue	3,252,073,913	3,160,230,044	2,843,544,078
Expend.	3,248,739,972	3,129,228,156	2,863,218,485

The budget for 1915-16 is detailed below:

Revenue	1000 lrs	Expend.	1000 lrs
Real property	15,817	Treasury	712,668
Railways	25,260	Finance	358,084
Land tax	90,325	Justice	58,833
Income tax	380,700	Foreign affairs	15,616
House tax	127,770	Instruction	176,292
Succession duties	66,950	Interior	185,848
Registration	107,500	Public works	68,276
Stamps	94,490	Posts and Tels.	148,407
Railway traffic	45,450	War	842,908
Excise	288,980	Marine	273,407
Customs	347,000	Agriculture, industry, commerce	28,815
Octrois	52,128		
Tobacco	875,080		
Salt	90,000		
Lotteries	107,000	Total ordinary	2,370,262
Quinine	2,900	Treasury	159,974
Posts	126,500	Finance	3,792
Tels. & tels.	44,800	Justice	102
Repayments	108,993	Foreign affairs	8
Virements	89,464	Interior	14,872
		Instruction	10,489
		Public works	165,695
<b>Total ordinary</b>	<b>2,699,590</b>		

Revenue	1000 lire	Expend.	1000 lire
Various receipts	11,714	Posts and Tels.	16,200
Railway const.	50,000	War	103,841
Movement of capital	2,240	Marine	11,810
Surplus	38,745	Agriculture, etc.	9,747
Loans	201,467	Colonies	94,858
Total extraordinary	307,477	Total extraordinary	590,282
Grand total	3,007,027	Grand total	2,960,545

Capital of the debt, June 30, 1915: 9,922,420,-633 lire consolidated debt; redeemable, 4,640,-247,111; permanent, 64,179,773; tribute to the Holy See, 64,500,000; treasury obligations, 1,236,-370,000; floating debt, 3,062,436,330—total, 18,-990,154,847.

**ARMY.** Unlike the other European Powers, Italy had ample notice of what would be required should she enter the conflict, and from August, 1914, to May, 1915, there was opportunity for preparation. At the outbreak of the war there had been mobilized: 94 regiments of infantry, grouped in 48 brigades, 25 divisions, 12 army corps, 2 regiments of grenadiers, 12 regiments of Bersaglieri (each of which had 1 battalion of cyclists), 8 regiments of Alpine troops, 36 regiments of field artillery, 2 regiments of heavy artillery, 2 regiments of mountain artillery, 10 regiments of siege artillery, 29 regiments of cavalry, 6 regiments of engineers, 1 battalion of technical arms, and 1 battalion of aviators. Naturally these forces were augmented gradually as the war developed, while the organization of supply and transportation was such as to elicit admiration from neutral observers. The supreme command of the army was vested in the King, who went to the front on the declaration of war; his chief of staff was Gen. Luigi Cadorna, and his assistant chief of staff, General Porro. In the infantry the term of service prior to the war was two years, and while the recruit was less developed than in other nations, he was trained assiduously, and even the southern soldiers became acclimated to the winter rigors of the high Alps. The troops of this arm seemed to have performed better in the war than was expected of their general reputation. All arms wear a gray-green uniform. The foot soldier is equipped with a knapsack, breadsack, wooden water bottle, cartridge box with 90 cartridges, cooking tin, shelter tent, and two pairs of shoes. After the élite or first line, the territorials, 32 to 39 years of age, were mobilized, and being fathers of families they were used in the supply service, though a number of battalions were in action and acquitted themselves admirably, having resistance and perseverance that more than compensated for any lack of dash of the younger troops. The Bersaglieri, while equipped and trained for fighting in low or rolling country, adapted themselves to the mountain warfare of the great struggle. The Alpini, who were recruited in the Alpine zones and had spent their two years of service entirely in the Alps, also proved distinctly useful in the field for which they had been trained. The mountain artillery found constant use against enemy camps on the heights, surprising groups forming in the valley, and against supply columns. In the trenches the mountain artillery was said to have been less effective, though it often was used to destroy barbed-wire entanglements. The field artillery at the outbreak of the war was armed with Krupp guns, transporting 250,000 soldiers and refugees in

but many batteries were being supplied with an improved deport gun with a split trail which permitted of high elevation and placing on slopes. The heavy artillery of Italy, good at the beginning, developed as hostilities progressed. There was considerable opportunity for brilliant military engineering in the way of constructing mountain and other roads and the transport of artillery to all but inaccessible positions. As in other European fields, the cavalry had but little opportunity for action, and many of its members were transferred into other branches. A Swiss military observer, who had an opportunity to see the Italian army at the front, wrote in the *Revue Militaire Suisse*: "The Italian army does not seem the least exhausted after seven months of war. In Italy the number of robust men who have not yet been mobilized is striking. The war has been conducted on enemy territory and Italy preserved from the horrors of war. Civil life goes on without apparent interruption. The operations have been so scientifically and prudently conducted that the army has great confidence in its commanders."

**NAVY.** See NAVAL PROGRESS.

**GOVERNMENT.** Previous to 1870 Italy was composed of the various states of Sardinia, the two Sicilies, the Pontifical States, the Lombardo-Venetian provinces of the Austrian Empire, the Grand Duchy of Tuscany, and the duchies of Parma and Modena. In 1870 the unity of the country was finally effected and Rome became again the capital of Italy, which is now divided for administration into provinces. The constitution vests the executive authority in the King, acting through a responsible council of 11 ministers. The legislative authority is vested conjointly in the King and a Parliament composed of a Senate (318 members) and a Chamber of Deputies (508 members). The King is required to convoke the Parliament annually, but may dissolve it at will. Reigning sovereign, Victor Emmanuel III, born Nov. 11, 1869; he succeeded his father July 29, 1900, and married, Oct. 24, 1896, Princess Elena of Montenegro. The heir-apparent is Prince Humbert, born Sept. 15, 1904. There are four other children, all daughters.

#### HISTORY

**THE MINISTRY.** The Salandra ministry was severely criticised during the year. In March the attacks became so serious that a crisis was narrowly averted. The Opposition accused the government of laxity in the conduct of the war, and said that unless they could be assured of greater energy in the future, they would refuse to support it. The ministry, however, after assuring Parliament that measures had been taken for preventing the repetition of past mistakes, succeeded in avoiding the crisis. In April, Baron Sonnino, in a speech reviewing the situation, said that Epirus had been occupied only for the time being and without any view of conquest, and that the admission of deputies from Epirus to the Greek Chamber was in accordance with the principles agreed upon at the London Conference of Ambassadors in regard to Albania. He assured Parliament that the Italians would help Serbia. He pointed to the efficient work of the Italian government in

spite of the many submarine attacks and the dangers from mines and from airships. As to the charge that the Austrians were maltreating Italian prisoners in Austria, he said that they had been visited by the American ambassador and Red Cross representatives and that no evidence of ill-usage had appeared. The Chamber of Deputies gave the government a vote of confidence on April 16th of 352 to 36. The attacks on the cabinet continued, however. One of the especial grievances charged by the Interventionists, whose leader was Bissolati, was the lack of frankness on the part of the cabinet which, they said, was designed to cover mistakes in the direction of the war. They insisted on a closer relation between the cabinet and Parliament. After the Italian reverses on the Isonzo, the cabinet crisis could no longer be avoided, and the Salandra ministry resigned on June 10th, having failed to receive from the Chamber of Deputies a vote of confidence on the budget of the ministry of the interior. The vote against the government stood at 193 against 141, and the prevailing element in the majority was the Interventionists, who consisted of 35 Radicals, 25 Republicans, 20 Reformist-Socialists, and 20 Democrats, also the Nationalists and a few others. Signor Boselli (q.v.), dean of the Chamber of Deputies, was chosen to form a new cabinet, on a national basis, which would be satisfactory to the different parties. This cabinet was announced on June 19th, with Signor Boselli as Prime Minister. Baron Sonnino was retained as Foreign Minister. Other important members of the new cabinet were Bissolati, who was a minister without a portfolio, and Orlando, Minister of Justice in the former cabinet, and now Minister of the Interior. Signor Bissolati was one of the Reformist-Socialists who had distinguished himself at the close of 1915 by declaring that "a vote against the ministry is a vote against the war." The ministry was described as purely national, for it comprised men of all parties and shades of belief. The Prime Minister himself and four of his colleagues were Liberal Conservatives. Besides Bissolati, the Reformist-Socialist, and Signor Orlando, who with three other ministers were Liberal Democrats, there were two Radical members, a Republican and a Roman Catholic. A feature that attracted much attention was this inclusion in the cabinet for the first time of a Roman Catholic, Signor Meda, in the department of finance, who was reported to be regarded with much sympathy by the Vatican, but it was officially explained in the Catholic press that he did not represent Catholic organizations and that he did not compromise the neutrality of the Holy See in Parliament. Signor Meda had strongly supported the Salandra cabinet. Another departure was the introduction of a representative of commerce in the ministry. In the Premier's announcement, he emphasized Italy's fidelity to the Entente, foreshadowed measures for the reduction of luxuries and the restriction of consumption of alcohol, and declared his faith in ultimate victory. In the vote of confidence that followed the government had a strong majority, the only serious opposition coming from the extreme Socialists who cast 44 votes against it.

**WAR MEASURES.** While trade with Austria-Hungary was prohibited on the declaration of war, May 23, 1915, trade with Germany was not formally prohibited till Feb. 11, 1916, when

a royal decree forbade exportation, importation, and transit through Italy of any German or Austrian products. The Cabinet Council on February 16th decreed that free trade with the Allied countries would be applied during the next five years to all machinery, raw materials, and manufactures necessary for the development of home industries. Subscriptions for the third war loan began on January 10th. Down to the close of February German ships had been interned in Italian ports, but on February 29th it was announced that 34 of them would be seized.

**DALMATIAN ASPIRATIONS.** The part played by the Italian desire to regain Dalmatia was the subject of continued discussion in 1916. It will be remembered that when von Bülow left Italy he publicly attributed the check in the negotiations to Italian agitation of the Dalmatian question. An important league was formed for this purpose. It was dominated by the democratic party and its committee of control comprised the majority of the radical and even of the clerical deputies. The president of the league, the Duke de Cesaro, set forth the Italian argument as follows: "Dalmatia," said he, "belongs to Italy by right and by necessity." The west coast of the Adriatic is almost indefensible, Italy having only two ports, one at the north, Venice, and the other at the south, Brindisi. On the other hand, the eastern coast is wonderfully well protected by a network of islands and is indented at frequent intervals. A fleet could coast along the entire shore, under this protection, without danger and submarines could take shelter there. Mines placed along the Dalmatian shore are carried by the current beyond the western coast. A nation is in a very serious situation when it finds itself obliged to shut up its fleet in an inland sea. Moreover, Dalmatia has been united with Italy by a long historic past and is now united as well by economic and industrial conditions. Dalmatia owes its modern civilization to the Venetian Republic. Its art and literature bear marks of Latin influence. To-day, Dalmatian industry is Italian. Factories, mines, quarries, electric plants, in short the best part of the industry of Dalmatia is in the hands of Italian companies—the engineers, the capital, and the manual labor being all Italian. The Italians did not, he said, claim the sole control over the Adriatic. They acceded to Serbia's demand for an opening on the sea, and admitted the legitimate right of the Slavic population to 200 or 300 miles of the coast. But the latter, who numbered only a million, would never become powerful enough to close the Adriatic to Austria and Germany. "That task," said the Duke de Cesaro, "belongs to Italy."

**ITALY AND HER ALLIES.** Toward the end of the year there was some doubt as to Italy's willingness to aid the Entente Allies in the East. It was thought that if the Germans should make an attack upon the forces under General Sarrail, the troops in that quarter would find themselves in a serious situation, and that Italy's aid would be necessary. A declaration by the Italian Prime Minister, Signor Boselli, tended to remove apprehension on the subject. He said by sending a contingent of her troops to take part in the campaign at Saloniki, Italy had conformed to her agreement as to perfect unity of action with her Allies. Italians had extended in the same manner to Rumania the

brotherly aid that it was in their power to give, and at the same time by this expedition Italy had shown and confirmed her decision to be always at hand at the development and the solution of the Balkan and Mediterranean problems in accordance with her own vital political and economic interests which were directly involved in the military events in that quarter. See **WAR OF THE NATIONS, Italy and the Entente, and Military Operations.**

**OTHER EVENTS.** Early in the year 25 Italian soldiers landed at Corfu, and this was supposed to indicate the beginning of a movement to aid the Allies. A deputy in the Greek Chamber immediately protested against this act. Meanwhile, Italy had decided to abandon Durazzo, which the Austrians were threatening, and transfer the troops from that point to Vallona. On May 16th the importation of luxuries and of articles not of the first necessity was prohibited, in order to facilitate freighting to the government. The embargo was to go into effect from June 4th, and included such articles as mineral waters, spirits, manufactured tobacco, woolen carpets, furniture, automobiles, etc. The government issued a decree in July rendering subjects of Austria-Hungary's allies liable to internment and to sequestration of property. In January the new Dutch minister presented himself at the Vatican. There was continued talk of Papal mediation on behalf of peace, and the rumors were revived on many occasions during the year, for example, at the conference of the Belgian Cardinal, Mercier, with the Pope in January and at the audience granted by the Pope to Premier Pashitch of Serbia, March 17th, and to Premier Asquith on April 1st. See **ARCHÆOLOGY.**

**IVANOV, NICHOLAS J.** See **WAR OF THE NATIONS.**

**IVORY COAST.** One of the colonies composing the government-general of French West Africa. The capital is Bingerville, with 78 European and 780 native inhabitants. The principal products for export are mahogany and other woods, palm kernels and oil, rubber, manioc, and ground nuts. See **FRENCH WEST AFRICA** for area, population, etc.

**I. W. W.** See **INDUSTRIAL WORKERS OF THE WORLD.**

**JACKSON, GEORGE THOMAS.** An American dermatologist, died in New York City Jan. 3, 1916. Born in New York in 1852, and educated at the City College there, he returned, after two years in foreign universities, to take his medical degree at the College of Physicians and Surgeons (Columbia) in 1878. With this latter institution he was long connected (1890-1913) as instructor and professor of dermatology, although during part of the same period he held chairs in the Woman's Medical College of the New York Infirmary and in the University of Vermont. Dr. Jackson published *A Practical Treatise on Diseases of Hair and Scalp* (1887, 1894); *Ready Reference Handbook of Diseases of the Skin* (1892; 7th ed., 1914); and, with C. W. McMurtry, *Treatise on Diseases of the Hair* (1912).

**JACOBS, JOSEPH.** A Jewish scholar, died in Yonkers, N. Y., Jan. 30, 1916. He had been in the United States since 1900, when he came to New York to serve as an editor of the *Jewish Encyclopædia*. Dr. Jacobs was born at Sydney, New South Wales, in 1854, and graduated from

St. John's College, Cambridge, in 1876. He devoted himself especially to the study of the history of ancient and modern Judaism, a field in which he became an authority. He was a founder, and president in 1898-99, of the Jewish Historical Society of England; secretary of the Russo-Jewish Committee; and had served as editor of the *Jewish Year Book* (1896-99), and of the *Literary Year Book* (1898-99). As editor, for some years, of the journal *Folklore*, he came to be recognized for his researches into the migration of fables and mythology from race to race, and he was almost as well known as a writer of fairy tales as Andrew Lang. After coming to the United States, Dr. Jacobs served as professor of English literature and rhetoric in the Jewish Theological Seminary of America, from 1906 to 1913, and as editor of the *American Hebrew*. He devoted much time to a sociological and statistical study of the Jews in England, America, and other parts of the world. Besides the literary work mentioned, and the editing of French and English classics, he published a life of Jesus from a Jewish point of view (*As Others Saw Him*, 1895); several volumes of English and Celtic fairy tales; *Studies in Jewish Statistics* (1890); *The Jews of Angevin England* (1893); *Literary Studies* (1895); *Jewish Ideals* (1896); etc.

**JAMAICA.** An island in the Caribbean Sea; the largest of the British West Indies; a crown colony with dependencies as follows: Turks and Caicos Islands, Cayman Islands, Morant Cays, and Pedro Cays. Area of Jamaica, 4297 square miles. Population, 831,383 (15,605 white, 163,201 colored, 630,181 black, 22,396 East Indian). Kingston (57,379 inhabitants in 1911) is the capital. Area under sugar cane (1914-15), 31,727 acres; under coffee, 18,175; under bananas, 85,854. Imports (1914), £2,565,820; exports, £2,904,533. Railway, 197 miles. Revenue (1914-15), £1,170,618; expenditure, £1,235,667. Debt (March 31, 1915), £3,893,577.

**JAMES, HENRY.** A novelist of American birth, who lived abroad most of his life and before his death became a British subject, died at his London home Feb. 28, 1916. He had been ill for some months, and doubtless his end was hastened by the intense interest and the energy he gave to the British cause after the outbreak of the European war; this, combined with his activity as chairman of the American Motor Ambulance Corps in France. The renunciation of his American citizenship in July, 1915, indicated mainly his desire to bind himself more closely to his many English friends in a time of national crisis, but it expressed also his distress that the United States had not championed the cause of the Allies. His funeral was held from Chelsea Old Church, and his body was cremated.

Henry James, in the forefront of the novelists of his day, and apparently assured of a permanent place in English literature, was born in New York City April 15, 1843. He was the son of a noted Swedenborgian theological writer and socialist, for whom he was named. His grandfather, William James, was a Scotch-Irishman who migrated to America and made a fortune out of Syracuse salt wells. This fortune supplied 11 children and their descendants so amply that means of livelihood were never in question. The grandfather's namesake, Henry's brother, became the famous psychologist and philosopher. The family early went abroad, and the boys were

educated in private schools and German universities, with liberal interlardings of travel and association with intellectual people. For an account of this period, two of the last books Henry James wrote should be consulted: *A Small Boy and Others* (1913) and *Notes of a Son and Brother* (1914).

At 19 James returned to the United States to enter Harvard Law School. He finished the course and was admitted to the bar, but never devoted himself to practice. In fact, while still studying, he had done considerable writing. His first story to appear, *The Story of a Year*, was published in the *Atlantic Monthly* in 1865. This and other sketches that followed were precocious rather than promising, and much of his early work James himself later preferred to ignore. He made a circle of friends in Boston and Cambridge who always remained his admirers, although after 1869 his periods of residence in this country were really but visits. First France and Italy attracted him: in the languages and literature of these countries he steeped himself. By 1880 he had settled in England, where, although he had a London residence, he cared most for the ancient dwelling (Lamb House) that he took at Rye, Sussex. He was never married.

Through the most acute and intensive observation of manners and character as he found them, especially in the cultured and wealthy circles in which he moved, Henry James built up the fund of material that served him in novel after novel. Particularly did he find in the American, provincial American, tourist in Europe an excellent foil to the continental European and his regard for convention—as appears in *The American* (1877) and *Daisy Miller* (1878). The second of these books, which created a sensation, is the only one that ever reached more than a small circle of readers. To James's devotees, however, on this side of the water and the other (in England they were known as the Jamesites), each new volume was an event. At first direct in treatment, simple and clear in style, fashioned on French models, his writings became more and more obscure, involved, and indeterminate, a maze of words and thoughts. Distinguished though he was as a theorist in the art of the novel, possessed of the highest technical skill, and a master of psychological analysis, James allowed himself to carry to an extremity his idea that fiction should be a cross-section of life, full of raw edges and loose ends. For the plot that could be done up in a neat parcel he had no use. That despite his eccentricity and barrenness of humanizing qualities, Henry James bulks so large among the men of letters of his time, is a tribute to the distinction that sets him apart from the crowd. Yet the popular novelist who turned out two volumes a year regularly might well envy his productiveness. The amount of writing, carefully pondered and polished, that he produced is enormous. Never pushed by necessity, and possessed of many social interests, he yet confined himself in a most methodical way to his work.

*Watch and Ward*, published in 1871, was his first novel. It was followed by *A Passionate Pilgrim* in 1875; but *Roderick Hudson*, which also came out in the latter year, was the earliest that the author stamped with final approval. Except for a long period of inactivity (1890-96),

it was an exceptional year that did not bring at least one volume from Henry James's pen. There were some 40 in all. *The American* and *Daisy Miller* have been mentioned as two of his chief works of fiction. Others that stand among the more notable include: *Washington Square* (1880); *The Portrait of a Lady* (1881); *Princess Casamassima* and *The Bostonians* (both 1886); *The Tragic Muse* (1890); *What Maisie Knew* (1897); *The Sacred Fount* (1901); *The Wings of the Dove* (1902); *The Ambassador* (1903), which best satisfied its author; and *The Golden Bowl* (1904). From time to time appeared also collections of short stories, such as *A Bundle of Letters* (1879), and various critical works. Of the latter, probably the most important are *French Poets and Novelists* (1878), a subject that he was eminently fitted to treat; *Nathaniel Hawthorne* (1880), for the "English Men of Letters Series"; and *Partial Portraits* (1888). *The Question of Our Speech* and *The Lesson of Balzac* were lectures, published in 1905. Among books directly the fruit of his travels may be mentioned *Portraits of Places* and *A Little Tour in France* (both 1884), *English Hours* (1905), and *Italian Hours* (1909). A collected and selected edition of *Novels and Tales*, in 24 volumes, appeared in 1909. In the latter year also was published one of a small group of plays—*The High Bid*, produced by Forbes Robertson. As early as 1895 his *Guy Domville*, of uneven merit, but notable for one scene, was presented at the St. James's Theatre, London.

Mr. James died full of honors. On New Year's day, 1916, not two months before his death, he received from King George V that coveted badge of distinction, the Order of Merit. A few years earlier, his 70th birthday was made the occasion of a remarkable tribute from 250 of his British friends, among them John Singer Sargent, who asked him to sit to that painter for his portrait. This likeness has been willed to the National Portrait Gallery. In the country of his birth, which is said to have been always of more interest to him than his voluntary expatriation might indicate, he was early chosen a member of the American Academy of Arts and Letters, and Harvard University conferred on him the degree of Doctor of Letters. A tribute that James probably cared little about was the growth of a large critical literature that was scarcely able to keep pace with his writing. The flattery of imitation could not touch him, and it is said that he was none too gentle with his practicing disciples; yet among his literary followers are to be counted several of the more notable American women writers—Edith Wharton, Anne Douglas Sedgwick, Katharine Fullerton Gerould, and Ellen Glasgow. In 1916 both Rebecca West and Ford Maddox Hueffer published books (the former containing bibliography) on Henry James.

**JAMES, THOMAS LEMUEL.** An American public administrator and banker, died in New York, Sept. 11, 1916. He was born in Utica, N. Y., in 1831. After an education at Utica Academy, he entered a printing office. For 10 years, from 1851, when with Francis B. Fisher he bought the *Madison County Journal* of Hamilton, N. Y., he was a newspaper editor. From 1861 to 1873 Mr. James was identified with the New York customs service, rising to be deputy collector. This he left to accept the postmaster-

ship of New York, offered him by President Grant, and to which he was reappointed by President Hayes. The remarkable improvement which he brought about in the city's mail service, and in the handling of foreign mail, gained him attention abroad as well as in this country, and when the office of Postmaster General became vacant the President wished to appoint Mr. James. For the sake of his work in New York he declined this offer, as well as that of the Republican mayoralty nomination. However, during 10 months in 1881-82 he did occupy the office of Postmaster General, accomplishing notable reforms, including retrenchments that made possible two-cent letter postage. He resigned after the death of President Garfield, when Arthur reorganized the Cabinet. Thereafter until his retirement a few years ago, Mr. James had been president of the Lincoln National Bank of New York, and at his death he was chairman of the board of directors of the Lincoln Safe Deposit Company.

**JAMMES, FRANCIS.** See FRENCH LITERATURE, *Poetry*.

**JAPAN.** An empire of the Far East. The capital is Tokyo.

**AREA AND POPULATION.** Japan consists of four large and many small islands, with a total area of 147,657 square miles. The large islands are: Honshiu, 86,305 square miles; Kiushiu, 13,768; Shikoku, 6856; Hokkaido, 30,144. Honshiu, called also Hondo and the mainland, has about three-fourths of the population. At the end of 1913, the legal population, as officially stated, was 53,362,682, compared with 49,588,804 in 1908 and 46,732,876 in 1903. Japanese residing abroad, Dec. 31, 1913, 335,171, of whom 107,704 in China, 88,526 in Hawaii, 77,736 in the United States, 12,253 in Canada, 11,893 in Brazil, 6661 in Australia, 5166 in the Straits Settlements, 4894 in the Philippines, 4858 in Peru, and 2737 in Mexico. Foreigners resident in Japan on the same date, 19,012, of whom 11,905 Chinese, 2827 British, 1733 Americans, 951 Germans, 554 French, and 219 Portuguese. The indigenous inhabitants (Ainos) of Hokkaido numbered 18,727 at the end of 1913 and 18,347 at the end of 1914.

The number of marriages in 1911 was 434,538, and the annual average for 1902-11, 408,059; divorces, 58,302 and 61,825; living births, 1,763,639 and 1,579,782; stillbirths, 155,319 and 154,628; deaths, 1,053,460 and 1,019,134; marriage rate per thousand inhabitants, 8.40 and 8.37; divorce rate, 1.13 and 1.27; living birth rate, 34.1 and 32.4; of living births, the number of boys per 100 girls, 103.98 and 104.60; percentage of stillbirths, 8.09 and 8.95; death rate, 20.4 and 20.9.

Resident population of the larger cities as reported for Dec. 31, 1913: Tokyo, 2,050,126; Osaka, 1,395,823; Kyoto, 509,380; Nagoya, 452,043; Kobe, 442,167; Yokohama, 397,574; Hiroshima, 167,130; Nagasaki, 161,174; Kanazawa, 129,804; Kuré, 128,342; Sendai, 104,141; Hakodate, 99,795; Fukuoka, 97,303; Sapporo, 96,924; Saseho, 94,914; Otaru, 92,864; Okayama, 86,961; Yokosuka, 85,473; Wakayama, 77,683; Kago-shima, 75,907; Shimonoseki, 72,117; Moji, 71,977; Tokushima, 70,292; Kumamoto, 68,167; Sakai, 67,706; Niigata, 66,622; Toyama, 64,822; Shizuoka, 64,108; Fukui, 56,218; Nawa, 55,547; Toyohashi, 54,673; Utsunomiya, 54,049; Kofu, 53,872; Gifu, 51,647; Maebashi, 50,061.

The dependencies of Japan are Korea (Chosen), Formosa (Taiwan), Karafuto (the southern part of the island of Sakhalin), Kwantung (a leasehold in southern Manchuria), and the Pescadores (Hokoto); total, 112,371 square miles, with an estimated population of about 19,700,000.

**EDUCATION.** The school system is well organized and efficient. Primary instruction is compulsory between the ages of 6 and 14. As reported for the school year 1913-14, public primary schools numbered 25,615, with 157,285 teachers (113,806 male, 43,479 female) and 7,095,755 pupils (3,802,653 male, 3,293,102 female). Secondary schools for boys numbered 318, with 6276 teachers and 131,946 students; superior schools for girls, 330, with 4117 teachers (of whom 1781 male) and 83,287 students. The number of normal schools was 86, with 1623 teachers and 27,928 students (of whom 19,023 male); superior normal schools, 4, with 222 teachers and 1766 students (of whom 1077 male). At special and technical schools there were 496,031 students. The four imperial universities had 9572 students: Tokyo, 5233; Kyoto, 1791; the Northeast, 1951; and Kiushiu, 597.

**AGRICULTURE.** The leading crop is rice, to which were planted in 1914 3,033,369 cho, yielding 57,006,000 koku (1 cho = 2.45 acres; 1 koku = 4963 bushels). To wheat were planted in 1914, 479,001 cho, yielding 4,488,000 koku; barley, 616,314 cho, 9,549,000 koku; rye, 727,900 cho, 7,207,000 koku. Other important crops are peas, beans, millet, colza, potatoes, and tea. The table below shows area in hectares and yield in thousands of metric quintals in 1915 and 1916, together with the yield per hectare in 1915 (the figures for 1916 are subject to revision):

	Hectares		1000 qs.		Qs. ha.
	1915	1916	1915	1916	
Rice	3,060,510	3,052,538	79,708	80,338	26.0
Wheat	505,823	518,985	7,021	6,653	13.9
Barley	1,310,685	1,258,258	21,960	21,738	16.8
Oats	65,622	62,681	1,026	.....	15.6
Corn	58,304	63,620	952	1,042	16.3
Potatoes	78,662	93,583	6,825	10,616	86.8
Flax	16,364	18,446	* 78	.....	3.8
Tobacco	80,546	29,280	480	510	15.7

\* Flaxseed, 77,760 quintals; fibre, 62,675 quintals.

Live stock at the end of 1912 and 1913 respectively: horses, 1,581,743 and 1,582,125; cattle, 1,399,498 and 1,388,708; sheep, 3303 and 2946; goats, 101,475 and 89,239; swine, 308,970 and 309,995.

**OTHER INDUSTRIES.** The value of mineral and metal products in 1913 is reported as follows, in yen: coal, 70,956,121 (21,315,962 tons); copper, 42,012,126; petroleum, 12,498,506; gold, 7,252,000; silver, 5,635,124; iron, 2,552,245; sulphur, 1,568,432; steel, 809,087; lead, 617,866.

In 1913, the total fisheries products were valued at 146,792,422 yen, as compared with 137,984,518 in 1912.

On Dec. 31, 1914, factories (with more than 10 employees) numbered 15,897; employees, 916,252 (375,596 male, 540,656 female). Cotton-spinning companies, June 30, 1915, numbered 38, with 2,354,258 spindles; consumption, 384,431,509 pounds of cotton; production, 335,426,573 pounds of yarn. Cotton-weaving companies, 16, with 26,954 looms; production, 247,557,169 pounds. Other important manufactures are

paper, silk, matches, pottery, lacquered ware, matting, and leather.

COMMERCE. The table below shows imports and exports of merchandise, in yen:

Imports:	Foreign produce		Japanese produce		Total
	1913	1914	1913	1914	
1904	370,807,791		552,948		871,360,739
1909	893,141,499		1,057,844		894,198,848
1912	618,160,786		831,491		618,992,277
1913	728,626,129		805,515		729,431,644
1914	594,502,221		1,283,504		595,785,725

Exports:	Foreign produce		Japanese produce		Total
	1913	1914	1913	1914	
1904	3,531,804		315,729,592		319,260,896
1909	3,139,191		409,973,820		413,112,511
1912	2,366,921		524,614,921		526,981,842
1913	2,938,968		629,526,250		632,460,218
1914	4,804,166		586,797,295		591,101,461

In 1904 specie and bullion were imported to the value of 33,940,856 yen, and exported, 107,795,858 yen; in 1909, 79,587,502 and 6,584,327; in 1912, 11,544,351 and 28,325,153; in 1913, 1,021,351 and 27,093,346; in 1914, 9,107,081 and 29,649,935.

Classified imports and exports of merchandise, in thousands of yen:

	Imports		Exports	
	1913	1914	1913	1914
Food, drink, and tobacco:				
Unmanufactured	77,458	52,119	24,655	26,105
Manufactured	43,125	26,621	37,488	37,418
Raw materials	353,542	828,741	51,340	45,492
Materials partly manufactured	126,927	96,253	328,084	806,360
Manufactures	124,029	87,249	184,914	167,890
Other products	4,851	4,753	5,979	7,887
Total	729,432	595,736	632,460	591,101

Principal imports of foreign merchandise in 1914 and 1915 respectively, in thousands of yen: raw cotton, 218,975 and 217,316; oil cake, 34,860 and 36,124; wool, 14,784 and 30,584; iron bars, rods, and plates, 24,745 and 21,388; sugar, 21,698 and 14,806; soy beans, 13,307 and 9300; machinery, 24,147 and 8816; petroleum, 8657 and 8464; rice, 24,824 and 4887; woolen cloth, 9067 and 3155. Leading exports of Japanese merchandise in 1914 and 1915 respectively, in thousands of yen: raw silk, 161,797 and 152,039; cotton yarn, 78,555 and 66,205; copper, 21,197 and 44,264; silk manufactures, 30,894 and 38,557; cotton shirtings, 34,844 and 38,511; coal, 23,975 and 19,289; tea, 12,718 and 15,402; matches, 11,052 and 14,717; straw plait, 14,355 and 14,132; refined sugar, 12,383 and 11,804; rice, 4974 and 9682; earthenware, 5914 and 6953; silk waste, 4673 and 5955; toys, 2592 and 4533; camphor, 2780 and 3475; matting, 2814 and 2281.

The table below shows imports and exports of merchandise by countries, in thousands of yen:

	Imports		Exports	
	1913	1914	1913	1914
British India	173,174	160,324	29,873	26,048
United States	122,408	96,771	184,473	196,539
United Kingdom	122,737	92,302	32,870	33,086
China	61,223	58,306	154,661	162,371
Germany	68,395	44,922	13,132	9,962
Kwantung	30,878	31,277	29,836	22,270
Du. E. Indies	87,389	22,025	5,149	5,479
French India	24,700	15,052	1,055	804
Australia	14,943	14,580	8,638	10,869
Philippine Islands	7,648	7,389	6,284	6,769
Egypt	7,143	6,829	1,371	1,823
Belgium	9,448	6,453	3,706	2,361
Sweden	5,089	4,881	74	38

	Imports		Exports	
	1913	1914	1913	1914
France	5,829	4,371	60,280	81,209
Siam	5,793	4,174	1,085	563
Straits Settlements	5,205	4,091	10,142	9,180
Austria-Hungary	3,890	1,906	987	545
Hongkong	1,295	876	33,622	33,277
Italy	1,078	753	29,417	11,097

Total, including other . . . . . 729,432 595,736 632,460 591,101

SHIPPING. There were entered at the ports in 1914 in the over-sea trade 9745 vessels, of 23,631,639 tons (of which, sail 294, of 47,157 tons); cleared, 9820 vessels, of 23,560,850 tons (of which, sail 298, of 46,703 tons). The number of Japanese vessels entered was 6597, of 12,752,390 tons; British, 1875 vessels, of 6,697,859 tons; American, 184, of 1,286,400 tons; German, 355, of 1,281,973 tons; Russian, 396, of 667,009 tons; French, 86, of 327,637 tons. Japanese shipping in the foreign trade receives government subsidy. The merchant marine on Jan. 1, 1915, consisted of: 2133 steamers above 20 tons, of 1,577,025 tons net; 7943 sail above 20 tons, of 513,244 tons net; and native craft to the number of 20,635.

COMMUNICATIONS. As reported for 1914, the length of railway in operation (including that in Formosa) was 6593 miles, of which 5472 miles were state railway and 1121 miles railway owned by private companies. Electric tramway, 1293 miles. Gross expenditure of the railways in 1913-14 was 120,612,571 yen; expenses, 98,307,545 yen. At the beginning of 1916 the total mileage open to traffic was 7131.71, of which 5686.26 miles belonged to the state. The total cost of construction was 832,741,126 yen. There were 3012 engines, 8048 passenger cars, 47,455 freight cars. They carried 213,368,710 passengers with 3,855,564,752 of traffic mileage, earning total fares of 55,547,850 yen. Handling 40,216,167 parcels through 3,046,498,912 ton miles (traffic mileage), the railways cleared 53,629,983 yen in freight.

FINANCE. The standard of value is gold. The monetary unit is the yen; its par value is 49.846 cents. Revenue and expenditure (ordinary and extraordinary) are shown below for fiscal years, in thousands of yen (budget estimates for 1915-16):

	1911-12	1912-13	1913-14	1914-15	1915-16
<b>Revenue:</b>					
Ord. . . . .	508,559	552,085	575,428	584,065	524,349
Extr. . . . .	148,638	135,307	146,547	104,063	79,198
Total	657,192	687,392	721,975	688,128	603,547
<b>Expenditure:</b>					
Ord. . . . .	409,889	416,895	415,636	414,682	402,281
Extr. . . . .	175,486	176,701	157,998	205,837	185,588
Total	585,375	593,596	573,634	620,519	587,864

The principal sources of ordinary revenue, as estimated in the 1915-16 budget, are as follows, in thousands of yen: saké excise, 90,554; land tax, 73,268; income tax, 35,266; sugar excise, 23,837; customs, 39,988; business tax, 13,645; tax on textile fabrics, 13,910 (total of these and other tax revenues, 316,455); public undertakings and state property, 151,956; stamps, 30,431; total estimated ordinary revenue, including items not here mentioned, 524,349. In the following table are shown by departments of gov-



ernment the 1915-16 budget estimates of expenditures, in thousands of yen:

	Ordinary	Extraord.	Total
Foreign Affairs .....	4,084	2,297	6,381
Interior .....	12,587	86,098	48,680
Finance .....	171,784	57,260	229,044
War .....	74,088	18,468	92,556
Marine .....	48,112	50,440	98,552
Justice .....	11,371	648	12,019
Public Instruction .....	9,600	805	10,405
Agriculture and Commerce ..	6,858	6,841	13,699
Communications .....	64,397	12,731	77,128
Civil List .....	4,500	.....	4,500
<b>Total .....</b>	<b>402,281</b>	<b>185,583</b>	<b>587,864</b>

The public debt, March 31, 1914, was 2,545,070,505 yen; March 31, 1915, 2,477,082,242 yen, of which 1,485,550,664 foreign and 991,531,578 internal. See also the article FINANCIAL REVIEW.

NAVY. See NAVAL PROGRESS.

GOVERNMENT. The constitution, which bears date of Feb. 11, 1889, vests the executive authority in the Emperor, who acts through a cabinet of ministers appointed by and responsible to himself. The legislative power is exercised by a parliament, or imperial diet, consisting of the House of Peers and the House of Representatives. The peers number 369, part of them having a seat in the Parliament for seven years and part of them for life. Representatives are 379 in number, elected for four years. The Emperor is Yoshihito, born at Kyoto, Aug. 31, 1879. He succeeded his father, Mutsuhito, July 30, 1912; the accession ceremony took place Nov. 10, 1915. On May 10, 1900, Yoshihito married Princess Sadako, born June 25, 1884. The issue is four sons, the eldest of whom, Prince Hirohito, born April 29, 1901, is the heir to the throne.

## HISTORY

GENERAL SUMMARY. As an outcome of the Oura bribery affair, noted in the last record, the parliamentary session of December 18th was a stormy one. A motion was brought to impeach the ministry for attempting to escape the responsibility in that case and to throw all the blame on Viscount Oura. This was defeated by a vote of 222 to 132, after a sharp debate in which the Prime Minister, Okuma, was bitterly attacked. In January, 1916, a bomb-thrower made an unsuccessful attempt to assassinate Count Okuma. On March 30th, Lieutenant-General Oka, Minister of War, resigned and died a few months later, being succeeded in the War Office by Lieutenant-General Oshima. In a statement issued early in the year, Count Okuma declared that Japan could not dispatch a large army to Europe owing to the lack of adequate means of transportation, and that Japan's work would consist merely in aiding the Allies in the Far East and supplying them with munitions. As to the economic effect of the war on Japan, statistics published in 1916 indicated an increase in the total exports to Russia during the first three-quarters of the year of 1915, also to Great Britain. Japanese merchants were trying to supplant German traders in the Southern Pacific. The exports in 1915, while showing an increase over 1914, were considerably below those in 1913, and imports had fallen off still more in the same interval. The exports for 1915 were \$354,153,499 and the imports \$266,

224,969. An important measure carried in 1916 was the child labor prohibition. This provided that no young person between 12 and 15, and no woman should work more than 12 hours a day, and that there should be two holidays a month. Accident compensation was also voted. The attacks upon the Okuma cabinet caused its downfall and a new ministry was announced October 4th with Count Terauchi (q.v.), former Governor-General of Korea, as Premier. On the opening of the Diet on Dec. 27, 1916, the address from the throne declared the union with the Entente Allies was becoming stronger and referred with congratulations to the new agreement with Russia. See following paragraph.

JAPAN AND RUSSIA. Ever since the outbreak of the war relations between Japan and Russia had been friendly and there had been many instances of coöperation toward the common end. On July 6th a political convention between Russia and Japan, consisting of two articles, was signed at Petrograd. By the first article Japan and Russia had declared that they would not be a party to any political arrangement or combination directed against the other. By the second they declared that if the territorial rights or special interest of either in the Far East were threatened, they would take counsel together as to measures for the safeguarding of those rights. It was explained that the agreement was not directed against any other power, and that it would not prejudice the interests of other powers in the Far East. This accord was warmly approved by all the other members of the Entente. It was the culmination of arrangements which since the treaty of Portsmouth (1905) marked the progress of Russia and Japan toward closer relations. In the first place there had been the agreement of 1907, which was for the purpose of avoiding misunderstanding. Then came that of 1910, with a view to developing the previous agreement for the purpose of consolidating peace in the Far East.

JAUNDICE, HEMORRHAGIC. (INFECTIOUS JAUNDICE; WEIL'S DISEASE.) A specific organism has apparently been discovered in connection with this disease. Investigators now generally believe that every case of hemorrhagic jaundice with relapses, with or without hemorrhages, should be regarded as infectious. This disease seems to have an incubation period of seven days and is similar to the icteroid typhoid described by Larrey in Napoleon's day, and later by Landouzy and Lancereaux in 1882. The organism has been isolated by Martin and is apparently identical with the *Spirochaeta icterohemorrhagica* described recently by Inada and Ido.

To Professors Inada and Ido was awarded on April 4, 1916, the Asakawa prize for their discovery of this causative organism in Japan, where the disease prevails endemically. Inada's first report appeared in Fukuoka *Ika-Daigaku-Zasshi* (Journal of the Medical College of Fukuoka Imperial University) on Jan. 20, 1915, and is entitled "Preliminary Report on the Study of the Spirochetosis that Develops Icterus and Hemorrhages that Prevail in Japan."

Results reported by Hübener and Reiter, and Uhlenhuth and Fromme, who have been working independently, show that the disease is transmissible in laboratory animals, the guinea pig being especially susceptible. The virus is filterable through Berkefeld filters. In the tissues

and blood of infected animals, especially in the liver, are found the characteristic spirochetal organisms which seem to show an unusual variability in form and exhibit no constancy in their morphology. From the swellings and nodules which they often present, the name *Spirochaeta nodosa* is proposed for them. The reports quoted were published in October, 1915. It appears therefore that the causative agent of this disease has been discovered independently in Germany and Japan.

**JAVA.** An East Indian island, the most populous and most important of the Dutch colonial possessions. See DUTCH EAST INDIES.

**JELlicoe, Sir John.** A British naval officer, appointed First Sea Lord in December, 1916. He was succeeded as commander in chief of the grand fleet by Sir David Beatty.

**JESSUP, WALTER ALBERT.** An American educator, chosen in 1916 president of the State University of Iowa. Since 1913 he had been dean of the university's College of Education.

**JEWELRY WORKERS.** See STRIKES.

**JEWISH RELIEF.** See JEWS AND JUDAISM; RELIEF FOR WAR VICTIMS.

**JEWS AND JUDAISM.** It is still impossible to give exact figures of the number of Jews throughout the world. No census has been taken since the years 1910-11, and the figures quoted are those based on the returns of the census taken in the above mentioned years. The *Jewish Year Book*, the best authentic source available for Jewish statistics, repeats in its last issue (1916-17) the tables of the last two years, which are: Total number of Jews of the world, 13,777,542, distributed among the continents as follows: Europe, 9,988,197; America, 2,500,054; Asia, 356,617; Africa, 413,259; Australia, 19,415. The European countries having a large Jewish population are Russia with its 6,060,415, followed by Austria-Hungary with 2,258,262; Germany with 615,021; Rumania with 269,015; Great Britain with 245,000; the Netherlands, 106,309; and France with 100,000 Jews. In America over 95 per cent of the entire Jewish population are distributed in the three most important countries: United States with a Jewish population of 2,349,754, followed by Canada with 75,681, and the Argentine Republic with 55,000. In Asia, Turkey, 177,500, and Palestine, 7800, are the most important seats of the Jewish population. Morocco, 110,000, and Tunis, 108,000, lead in the number of Jews in the continent of Africa. That the figures quoted are not exact is self-evident. The natural increase of a population of over 13,000,000 for half a decade or more is quite considerable, and has undoubtedly raised the total population of the Jews by a high figure. Especially erroneous are the estimates made for Russia and the United States. The former is based on the 1905 census, and the latter on the 1910 census, which gave only the number of the Yiddish-speaking Jews. Accordingly, the latest estimates for Russia were 7,000,000, and for the United States, 3,000,000 or above. In view of all these facts, we can safely place, in spite of the havoc wrought in them by the war, the total number of Jews throughout the world to be 14,000,000.

**GENERAL EVENTS.** The central point in Jewish history in 1916 is still the great war and its effects. But, while economic misery and commercial ruin, occasioned by the duration of the war, have considerably increased among the Jews

of the war zones, and especially among those of Russia, Poland, and Galicia, the past year has not witnessed any great and shocking tragedies in Jewish life, such as the wholesale expulsion of half a million Jews from their homes which occurred during the preceding year. Excepting the two great events, the entrance of Rumania into the war and the invasion of the Bukowina and a great part of Galicia by the Russians, which added misery and suffering to more than 300,000 Jews, the great mass of east European Jews remained during 1916 in statu quo, and the course of their history has not been greatly deviated from that of the preceding year. On the contrary, the black cloud of the war has displayed its silver lining during the year. The remarkable vitality of the Jewish people has asserted itself. A great deal of constructive work has been accomplished during the year. The Polish Jewry under a new régime, enjoying full civil rights, has completely reorganized itself. Especially notable are the events of establishing a net of elementary and a number of higher schools where the languages of instruction are Yiddish and Hebrew, and the organization of charitable and social work. A number of conferences were held during the year in Warsaw and other cities which dealt with the regulation of Jewish life and brought good results.

Not less remarkable was the work of the Russian Jewry. In spite of the great disadvantages that beset the work of recuperation, the reconstruction of Jewish life went on regularly and continuously. The great mass of refugees, transferred to new places of habitation beyond the pale, were aided by their brethren outside of the war zone, and especially by the committees of Petrograd and Moscow in adjusting themselves to their new environment, in organizing their individual as well as their communal lives. Especially fruitful was the work in the field of education. Numerous schools were established for the children of the refugees in cities of inner Russia where a Jew has never stepped on their sacred soil. Loan societies and other coöperative institutions tending to alleviate the misery of the expelled were organized by the various committees and preparations made for a Jewish Congress after the war.

**RELIEF WORK AND CONGRESS MOVEMENT.** The effect of the war upon the Jews outside of the war zone tended to consolidate the various factions in Jewry and stimulate their Jewish consciousness. Accordingly, the work for the relief of their stricken brethren was very intense, and especially in the United States. Of the \$6,500,000 collected in this country during the last two and one-half years, about two-thirds of the sum was collected during the year 1916. The naming by the President of January 27th as the Jewish relief day and the complete organization of the various relief committees throughout the country, were the principal factors in the successful work.

The congress movement which originated last year had to face its difficulties and struggle its way towards realization. It almost threatened to divide American Jewry into two camps, but the crisis was finally averted. The bone of contention was the nature and character of the proposed assembly, whether it should be a congress, namely, a representative body elected by the people, or a conference of representatives

of certain organizations. The masses were for the former type, while the American Jewish committee advocated the latter type. In March, 1916, a preliminary conference attended by a large number of delegates was held at Philadelphia and adopted a resolution endorsing the calling of a congress. The other party called a meeting in June and decided in behalf of a conference. Negotiations for a settlement were begun, and after one compromise was rejected by the Philadelphia delegates, a final agreement was reached recently (Oct. 2, 1916), whereby the two principles laid down by the Philadelphia conference, namely, democratic representation and the demand from the future peace conference for the protection of Jewish rights in Palestine, were accepted by all. See also RELIEF FOR WAR VICTIMS, *Jewish Relief*.

**LABOR AND LEGISLATION.** The Jewish labor world in this country, which centres principally around the clothing industry, was stirred to its depths by the declaration of a strike in the most important branch of the industry, in the cloak and suit trade. The manufacturers refused arbitration and as a result a lockout was declared by them early in May, and as a subsequent result, the workers declared a general strike which affected 60,000 laborers, 80 per cent of whom were Jews. The strike lasted for 13 weeks and was finally settled. In addition there occurred also minor strikes, the most important of which was the tailor strike. See ARBITRATION AND CONCILIATION, INDUSTRIAL; STRIKES.

The most notable legislative matter affecting Jews was the attempt of Congress to impose a literacy test for immigrants, exempting the Russian Jews on the basis that they come from a land where educational opportunities are denied them. To the minor legislative events may be counted the passing by the New Jersey Senate of a law requiring the reading of passages from the Old Testament in the public schools as well as the defeat of a similar bill in the New York Legislature.

**PERSECUTIONS AND DISABILITIES.** The year on the whole presents a brighter aspect than the preceding year as far as this phase of Jewish life is concerned. Yet it has its quota of persecution, especially in Russia and Rumania. In the former, the real Russians were very active in the early part of the year in propagating hatred against the Jews, and spreading rumors that the Jews raise the prices of food, and are working against the success of the loans of the government, and as a result disturbances occurred against the Jews. These activities, however, were later checked by the government. A slight change in the statute affecting the promotion of Jewish lawyers occurred, and a percentage system was inaugurated. The educational restrictions were also extended to private schools. There occurred also some slight expulsions from frontier towns, but the orders for some were later revoked. In general, the policy of the Russian government towards the Jews was an unstable one. At times it tended to lighten their burden, but it soon relapsed to its former system of oppression. In Rumania, the Jewish situation was aggravated by a systematic expulsion of Jews from villages and frontier towns.

**LITERARY AND MINOR EVENTS.** The war has stimulated literary activity among the Jews of this country. The most important event of the

year is the establishment of a number of weeklies: *The American Jewish Chronicle* in English; the *Hatoren* (the 'Mast'), and the *Haiברי* (the 'Hebrew'), in Hebrew. The lovers of Hebrew and Yiddish literature throughout the world had their joys and sorrows during the year, the former in celebrating the 25th literary anniversary of the foremost Hebrew poet, Ch. N. Bialik, and the 60th birthday of Ahad Haam (Asher Ginzberg), the leading Hebrew thinker and essayist; the latter in mourning the deaths of Joseph Jacobs (q.v.), Scholem Aleichem (q.v.), and Simon Frug, a notable poet in the Russian, Yiddish, and Hebrew languages. Of the books issued during the year the most important was the translation of Dubnow's *History of the Jews in Russia and Poland*, published by the Jewish Publication Society. An important event for Judaism in this country is the dedication and the opening of the Rabbinical College, an orthodox seminary for training rabbis on a modern basis. Of minor events, there can be recorded the celebration of the 50th anniversary of the *Reform Advocate*, the leading organ of the reform Jews, and the celebration of the 70th anniversary of the congregation Shaare Tephila of New York City, and the 75th anniversary of the congregation Beth Ahaba of Richmond, Va.

**ZIONISM AND NATIONALISM.** The year 1916 saw the Zionist movement emerge from the difficulties imposed upon it by the war triumphantly. Not only was it not crushed, as it was predicted by some, but it took a new lease on life. Only a small number of the colonists left Palestine; the great majority became Ottoman subjects and, aided by the Zionists throughout the world, carried on their work as heretofore. The educational institutions in the Holy Land were reopened with full attendance. The movement as a whole increased during the year, both in the number of its adherents and in moral strength. The work was intense, especially in this country. The Provisional Committee, which is at present the central organization of the Zionists of the world, supported by Justice Brandeis (q.v.), has raised during the year large sums of money for the support of the Palestinian colonization. Two conventions, that of the Order of Sons of Zion and the Federation of the American Zionists, were held during 1916 in the months of June and July respectively, and both were attended by hundreds of delegates. Zionist activity was not limited to neutral ground only, but also the Jews of the belligerent countries contributed their share, especially those of Poland, where Zionist activity was recently revived at a conference of all the Polish Zionists at Warsaw. On the whole, Jewish national sentiment ran high during the year, and manifested itself even in such communities where it was least expected. To the latter belongs the formation of a league of the young Italian Jews under the name *pro causa Hebraica*.

**JOFFRE, JOSEPH J. C.** See FRANCE; WAR OF THE NATIONS.

**JOHNS HOPKINS UNIVERSITY.** A non-sectarian educational institution at Baltimore, Md., founded in 1876. In some departments both men and women are admitted, and in others men only. The university is best known for the opportunities for graduate work that it offers. In 1916, 2759 (less duplications,

2559) students were enrolled—1011 in regular courses, 1095 in afternoon and night courses, and 653 in summer courses. The faculty, in which there were no notable changes during the year, numbered 286. Gifts amounting to \$116,198 were received, the chief item being a bequest of \$106,825 from James N. Beall of Baltimore, to be used for general purposes. In the year 1915-16 the productive funds of the institution amounted to \$6,551,000, and the income to \$549,777. In the library were 193,000 volumes. President, Frank Johnson Goodnow. See also UNIVERSITIES AND COLLEGES.

**JOHNSON, HIRAM W.** Elected Republican United States Senator from California, Nov. 7, 1916. See CALIFORNIA, *Politics*; UNITED STATES, *Presidential Campaign*.

**JOHORE.** A native state located at the southern extremity of the Malay Peninsula, and under British control. Estimated area, 9000 square miles; population (1911), 180,412, about one-half Malays and one-third Chinese. Johore Bharu, the capital, has about 20,000 inhabitants.

**JOINT STOCK BANKS.** See AGRICULTURAL CREDIT.

**JONES, A. A.** Elected Democratic United States Senator from New Mexico, Nov. 7, 1916.

**JONES, HARRY CLARY.** An American chemist, died in Baltimore, Md., April 9, 1916. He was born at New London, Md., in 1865, and, except for a period of study at Leipzig, Amsterdam, and Stockholm, was connected with Johns Hopkins University from the time that he entered it as a student in 1885. There, after graduating and taking his Ph.D. (1892), he taught, rising to be professor of physical chemistry in 1904. It was in recognition of his distinction in this branch of science that the Franklin Institute awarded him its Langstreth medal in 1913. He was a research associate of the Carnegie Institution. Professor Jones was an associate editor of French, German, and American chemical journals, and besides translating an important German work, he wrote, among other volumes: *Elements of Physical Chemistry* (1902; 4th ed., 1915), translated into Russian and Italian; *Elements of Inorganic Chemistry* (1903); *Electrical Nature of Matter and Radioactivity* (1906; 3rd ed., rev., 1915); *Introduction to Physical Chemistry* (1910); *A New Era in Chemistry* (1913); *Conductivities and Viscosities in Pure and in Mixed Solvents* (1915).

**JONES, ROBERT EDMOND.** See DRAMA; MUSIC, *Ballet*.

**JORDAN, EBEN DYER.** An American merchant, died at his summer home at West Manchester, Mass., Aug. 1, 1916. The son and namesake of the founder of the drygoods firm of Jordan, Marsh, and Company of Boston, Mr. Jordan was born in Boston in 1857. After a course at Harvard College, unfinished because of ill health, he entered his father's store as a clerk, gradually rising until by 1880 he had become a member of the firm. Later he succeeded to the presidency. The store came to be one of the best known in the country. Mr. Jordan's interests outside business were varied. He established the Jordan Art Gallery, and made a collection of paintings notable for the care used in selecting as well as for intrinsic worth. Of musical organizations he was a liberal supporter, becoming president of the New England Conservatory of Music (to which he left \$100,000)

and of the Boston Opera Company, a director of the Metropolitan Opera Company of New York, and honorary director of the Royal Opera, London. For long he had a famous stud of hackney horses, the American Hackney Horse Society electing him its president in 1905. Besides his own business, he had various commercial interests in Boston. His father's estate, of which he was a trustee, consisted of about \$3,000,000.

**JUDAISM.** See JEWS AND JUDAISM.

**JUKES FAMILY.** See ZOOLOGY, *Heredity*.

**JUPITER.** See ASTRONOMY.

**JUSTICE.** A play by John Galsworthy. See DRAMA.

**JUTLAND, BATTLE OF.** See NAVAL PROGRESS; WAR OF THE NATIONS.

**JUVENILE COURTS.** Special courts for the hearing of cases growing out of violations of the law by boys and girls have now been established in all cities and are in process of extension to rural communities. These courts are based primarily on the belief that usual methods of dealing with youthful offenders harden their natures and that reform and prevention should be striven for. In place of trial by jury before an open court with newspaper publicity, there has been substituted private hearings by the judge alone. This affords an opportunity for an individual treatment of each case. In addition probation officers and social workers can be in personal touch with the youthful delinquent and seek to better the home life and the habits and attitude of parents as well. In some of these courts there have been established psychopathic clinics for the study and treatment of the feeble-minded or mentally defective. The most advanced step in this direction was taken by Chicago in 1916 in the establishment of the Chicago and Cook County School for boys. This school for delinquents will advance the work of the Juvenile Court in many respects. Some courts also maintain clinics for the correction of physical defects. So important is becoming the study of physical and mental disorders that the view of child and youth as willful law breakers, that is, as purposeful criminals, is being abandoned in favor of the view that they are abnormal, defective, or suffering from lack of proper education or home training.

**VARIOUS IMPROVEMENTS.** The New York Legislature in 1915 passed a law giving the children's courts of New York City a board of justices of their own and separating these courts entirely on the administrative side from any adult criminal courts. Experience under this change has shown that cases are handled more readily and effectively, judges acquiring greater experience and proficiency. In New York City the Commissioner of Police found that the organization of juvenile police, consisting of forces of 25 or more boys in any police precinct, such boys being between the ages of 11 and 15, proved an effective factor in the prevention of delinquency. In Seattle and San Francisco forward steps were taken in prevention of juvenile delinquency through cooperation of boards of education with the courts and the completion of new buildings.

Improvements in the Boston Juvenile Court resulted from the report of the State Commission on Probation provided by the State Legislature in 1915. This commission recommended

that the Juvenile Court be given jurisdiction of parents under many circumstances. They also further protected the children's sessions from publicity and excluded children from the trials of adult criminals. A new provision regarding appeals was proposed which would guarantee that every appeal of a juvenile case should be heard by the higher court and that the Supreme Court would hold special sessions for juvenile cases with separate trial list and docket. Previously a large proportion of appealed cases remained unheard.

In Maryland the Legislature gave the judges of the Circuit Court power to designate one of their number to sit in juvenile cases. This makes possible the extension of the juvenile court system to all the counties of the State.

In Chicago, Judge Victor Arnold succeeded Judge Merritt W. Pinckney as judge of the Juvenile Court, the latter withdrawing on account of ill health. During Judge Pinckney's seven years' term of office 11,819 delinquent boys and 4089 delinquent girls came before him. His administration achieved the appointment of probation officers by test of merit, appointment of a woman assistant to the judge of the court, the establishment of the first psychopathic laboratory, and the successful establishment and administration of funds for parents.

**DISTRICT OF COLUMBIA.** A new juvenile court law applying to the District of Columbia was passed by Congress. An amendment providing that juvenile offenders be assigned to correctional institutions by separation of race and that officers of institutions be assigned according to race, was defeated. The law provided that the Board of Children's Guardians shall be appointed by the judge of the Juvenile Court instead of by the judges of the Police Court as at present; that the court may in its discretion place children, if taken from their parents, under the guardianship of an individual, or an incorporated society or the Board of Children's Guardians (the previous law named only the latter agency); that the court shall continue to have jurisdiction over the child even though it be placed under the guardianship of another agency; and that the detention house shall be under the control of the juvenile court instead of the police. The old law made the Juvenile Court essentially a police court with procedure and terminology according to the traditions of the criminal law and criminal courts. Under it, for a slight misdemeanor, a child acquired a "record" which would forever disqualify him from jury duty, and perhaps from holding office or entering public service.

**KAISER-WILHELMSLAND.** That part of the protectorate of German New Guinea which is in the island of New Guinea. The estimated area is 70,135 square miles. The number of inhabitants is not definitely known, but is estimated at about 531,000. The country was taken by Australian military forces in October, 1914. See **GERMAN PROTECTORATES.**

**KALOGERPOULOS, NIKOLAS.** A Greek statesman, who became premier the middle of September, 1916. He had lived long in France, where he took the degree of Doctor of Laws at the University of Paris, and had been Minister of Finance and Minister of the Interior. He announced a policy of benevolent neutrality toward the Entente cause in the European war. His cabinet was overthrown within a month and  
Y. B. 16—13.

Prof. Spyridon Lambros (q.v.) became the next premier.

**KAMERUN.** A German protectorate of west central Africa, between Nigeria and French Equatorial Africa, occupied by the French and British in 1916. It extends north to Lake Chad and east, at one point, to the Ubangi River. The coast line is broken by the comparatively small Spanish colony of Rio Muni y Cabo San Juan. Kamerun has an estimated area of 790,000 square kilometers (305,000 square miles), which is about 46 per cent larger than the area of Germany. The protectorate was established by the Germans in 1884, but a considerable part of the country was ceded by France from French Equatorial Africa in 1911. The population of this ceded territory is supposed to approximate 1,000,000; the population of the remainder of the protectorate has been estimated at over 2,650,000, consisting of: native colored, 2,649,000; other colored, 2000; whites (Jan. 1, 1913), 1871, of whom Germans, 1643.

Imports and exports were valued in 1912 at 34,242,000 and 23,336,000 marks respectively; in 1913, 34,816,000 and 29,151,000. Imports from Germany in 1912, 27,216,000 marks; exports to Germany, 19,841,000. Leading imports include machinery and other manufactures of iron and steel, cotton fabrics, rice, provisions, and fish. Principal exports in 1912 and 1913 respectively, in thousands of marks: 11,473 and 12,122; palm kernels, 4406 and 6226; cacao, 3721 and 5718; palm oil, 1622 and 1961; cola nuts, 167 and 971; timber, 696 and 941; ivory, 536 and 824; bananas and banana meal, 18 and 68. Railway in operation at the end of 1913, 310 kilometers (193 miles); under construction, 133 kilometers (83 miles). The budget for 1914-15 was continued for 1915-16; it balanced at 32,490,409 marks, 14,094,091 marks being the estimated local receipts, 3,166,318 marks imperial contribution, and 15,230,000 marks loan. German administrative headquarters, Buëa.

Toward the close of 1915, after Buea, which had become the temporary capital for the Germans, was taken by the Entente troops, the town of Yaunde was declared the capital. This also was occupied by a British force on January 1st and the Germans retreated. The conquest of the country by the Allied forces was completed on February 18th. Operations had been begun in Kamerun on Aug. 25, 1914, when a British force advanced across the border and captured a few towns, but it soon met with reverses and was obliged to withdraw. On Sept. 27, 1914, British warships bombarded the port of Duala; on October 14th Jabassi fell into the hands of the British, who also captured Susa on October 19th; on October 26th, Edea was captured by the British and French, and by the close of the year 1914 the railway from Bonaberi was in the hands of the Allies. See **GERMAN PROTECTORATES; WAR OF THE NATIONS.**

**KAMIMURA, HIKONOJO.** A Japanese admiral, died Aug. 8, 1916. He was born in Satsuma in 1849. His first active service of importance was as commander of a cruiser in the Chino-Japanese War of 1894-95. As vice-admiral and commander in chief of the second squadron, he was prominent in the Russo-Japanese War. His failure to prevent the sinking of two transports loaded with Japanese troops, when responsible for checking the activities of the three vessels comprising the Russian Vlad-

vostok squadron, brought him temporary unpopularity, which was later overcome when in August, 1904, he defeated these three warships, sinking one and badly damaging the other two. Later he did notable service in the battle of the Sea of Japan, the last great battle of the war. Afterwards he received the title of baron, and was decorated. In 1910 he was promoted to full admiral, in command of the first squadron, and in 1911 was appointed supreme military counselor. Admiral Kamimura is also thought to have led the naval assault made in cooperation with the British squadron, against the German military base at Tsingtao, China, in 1914.

**KANSAS. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 1,840,707. The population in 1910 was 1,690,949.

**AGRICULTURE.** The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture in 1915-16, were as follows:

	Acreage	Prod. Bu.	Value
Corn ..... 1916	6,950,000	69,500,000	\$62,550,000
..... 1915	5,550,000	172,050,000	87,746,000
Wheat .... 1916	8,174,000	98,022,000	160,756,000
..... 1915	8,525,000	106,538,000	94,819,000
Oats ..... 1916	1,550,000	36,425,000	20,034,000
..... 1915	1,500,000	39,750,000	14,708,000
Potatoes ... 1916	70,000	4,970,000	8,200,000
..... 1915	71,000	5,893,000	4,861,000
Hay ..... 1916	1,680,000	2,604,000	19,790,000
..... 1915	1,766,000	a 4,062,000	22,747,000
Rye ..... 1916	46,000	667,000	784,000
..... 1915	50,000	800,000	608,000
Barley .... 1916	800,000	4,800,000	3,696,000
..... 1915	270,000	8,370,000	3,515,000

a Tons.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments..	3,435	3,136
Average number of wage earners.....	44,215	41,259
Capital invested.....	\$156,090,000	\$163,790,000
Wages.....	25,904,000	25,970,000
The value of materials used.....	206,004,000	261,148,000
The value of products.....	325,104,000	323,234,000

**MINERAL PRODUCTION.** The lead and zinc mined in the State in 1915 was valued at \$3,676,448, or about three times the value of the production of 1914. There were produced 1618 short tons of lead concentrates, and 27,753 short tons of zinc concentrates. The total crude ore in which the lead and zinc were produced amounted to 709,400 short tons.

The petroleum production of the State in 1915 was 2,823,487 barrels, compared with a production of 3,103,585 barrels in 1914.

**TRANSPORTATION.** The total number of miles operated by railroads in the State on June 30, 1916, was 9557. The roads having the longest mileage are the Atchison, Topeka, and Santa Fe, 2815; Missouri and Pacific, 2384; Chicago, Rock Island, and Pacific, 1167; the Union Pacific, 216. There was no railroad construction of great importance during the year. The Anthony and Northern, an independent road, added to its mileage 20 miles. The Silinia Northern

was completed to Lincoln Center, a distance of 35 miles, during the year, and has since been completed to Osborne. This road has now 80 miles in operation.

**EDUCATION.** The total school population of the State in 1915 was 507,605. The total enrollment was 394,823. The average daily attendance was 308,016. The teachers, male and female, numbered 15,015. The average monthly salary of male teachers was \$85.70, and of female, \$68.20.

**FINANCE.** The report of the State Treasurer for the fiscal year ending June 30, 1916, showed a balance in the treasury on June 30, 1915, of \$147,435. The receipts for the year amounted to \$11,243,757, and the disbursements to \$10,876,256, leaving a balance on June 30, 1916, of \$1,686,215. The State has no debt.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include the Topeka State Hospital, the Osawatimie State Hospital, the State Hospital for Epileptics, the Home for Feeble-Minded, State Orphans' Home, the Larnard State Hospital, the Parsons State Hospital, and the Tubercular Sanatorium.

**POLITICS AND GOVERNMENT.** The Legislature did not meet in 1916. The chief political interest in the campaign centred about the election of Governor. Arthur Capper was a candidate for reelection. In the election of November 7th Governor Capper received 354,549 votes, compared with 192,037 for Lansdon, his Democratic opponent. Although the Republicans elected their Governor and other State officers and a majority in the Legislature the State was carried by Wilson by a plurality of 36,930. The vote was: Wilson, 314,588; Hughes, 277,658.

**STATE OFFICERS.** Governor, Arthur Capper; Lieutenant-Governor, W. Y. Morgan; Secretary of State, J. T. Botkin; Treasurer, Walter L. Payne; Auditor, Fred W. Knapp; Attorney-General, S. M. Brewster; Superintendent of Instruction, W. D. Ross; Commissioner of Insurance, C. J. Wilson—all Republicans.

**JUDICIARY.** Supreme Court: Chief Justice, William A. Johnston; Associate Justices, Rousseau A. Burch, Henry F. Mason, Silas Porter, Judson S. West, John Marshall, and John S. Dawson; clerk, D. A. Valentine.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Republicans .....	33	103	136
Democrats .....	7	20	27
Socialists .....	..	2	2
Republican majority..	26	81	107

See also FLOODS.

**KANSAS, UNIVERSITY OF.** A co-educational State institution at Lawrence, Kan., founded in 1866. In the summer session of 1916, 817 students were enrolled and in the fall, 2716. The faculty, in which there were no notable changes during the year, numbered 240. No large gifts were received. The productive funds amounted to \$151,000 and the total income to \$625,000. There were 200,000 volumes in the library. Chancellor, Frank Strong.

**KAOLIN.** See DIPHTHERIA.

**KARAFUTO.** That part of the island of Sakhalin which lies south of latitude 50° N. It is a part of the Empire of Japan. The area is stated at 2208.9 square ri (13,155 square miles). The population is upwards of 50,000, mostly

Japanese. The Japanese government encourages migration to Karafuto, which has much soil suitable for agriculture and pasturage and large forests of fir and larch. An important industry at present is herring fishing. Coal and alluvial gold occur. Imports and exports in 1913 were valued at 5,202,605 and 4,371,970 yen respectively, as compared with 3,357,747 and 2,422,398 in 1912. The budget for 1915-16 balanced at 1,895,833 yen.

**KARELL DIET**, or **KARELL CURE**. This system of treatment for dropsical conditions is simple and easily carried out and offers probably the best results in combating this symptom. The technic consists in administering daily 200 c.c. of milk, raw or boiled, according to the patient's taste, at four-hour periods during the day, until he loses weight rapidly, this occurring usually at the end of a week. If hunger and thirst become urgent, a small piece of toast may be given with the milk, and the mouth may be rinsed out with water, none of this, however, being swallowed. The diet is gradually increased by adding an egg, unseasoned, and white bread or toast. This ration is gradually augmented until a full diet is attained, but not more than 800 c.c. of fluid in the form of milk should be given during this period. When the full diet is reached, cocoa and tea may be substituted for milk. Fluids are restricted to 800 c.c. daily for two to four weeks after the edema has disappeared. During the treatment the patient must remain in bed, and occasionally, when symptoms are urgent and there are dyspnea, oppression, restlessness, weak pulse, or signs of uremic poisoning, other measures must be taken, according to the indications.

**KARL**, **TOM**. An American operatic tenor, died at Rochester, N. Y., March 19, 1916. He was born in Dublin, Ireland, in 1846, and early studied in England under Henry Phillips, and later in Italy. When the oratorio of *Elijah* was first produced, Mr. Karl sang the title part. For some years he sang in the Italian cities, including a season at La Scala, Milan, and in 1871 came to the United States, where he first toured with the Parepa-Rosa English Opera Company, and later joined a noted light opera organization, the Boston Ideals. With this he made his first real hit, as Ralph Rackstraw in *Pinafore*. After some years, Mr. Karl formed, with W. H. MacDonald, H. C. Barnabee, and other well known singers, the Bostonians, and this company long was popular in Gilbert and Sullivan and other operas, their greatest success being DeKoven's *Robin Hood*. Mr. Karl is said to have had a repertory of 150 operas and operettas. In later years he taught music in Rochester.

**KAROLYI**, **COUNT MICHAEL**. See *AUSTRIA-HUNGARY, History*.

**KELLOGG**, **CLARA LOUISE**. An American prima donna, died at New Hartford, Conn., May 13, 1916. She was born in the South, at Sumterville, S. C., in 1842, but her parents were from the North, and when Miss Kellogg was 14 the family went to New York to live. For several years she studied there under Rivarde, making her professional debut in 1860 at Pittsburgh as member of a concert company. In 1861 she first appeared in opera at the Academy of Music in New York, as Gilda in *Rigoletto*, and two years later, when she was only

20, she created the rôle of Marguerite in Gounod's *Faust*. From the first, this was one of her greatest successes, abroad as well as in the United States; she was engaged to sing in this opera at Her Majesty's in London in 1867. For three years after her return she gave herself to concert and oratorio work, under the management of the brothers Strakosch; to Carl Strakosch she was married in 1887. Miss Kellogg sang much abroad, appearing often before royalty. Her repertory included 40 rôles. She was properly called a dramatic soprano, for her voice, the equal of that of any contemporary soprano singer, was but half her equipment. It is said that Edwin Booth was so impressed by her histrionic ability that he urged her to devote herself entirely to acting. For three years, from 1874, Miss Kellogg headed an opera company singing in English operas of all schools, and she was a pioneer in this field. From 1881 she appeared mostly in concert, and in 1887, after her marriage, retired. Nordica and Sembrich, active for so many more years, were among her intimate friends, and she had a large acquaintance in American musical and literary circles. Her reminiscences were published in 1913 as *Memoirs of an American Prima Donna*.

**KELLOGG**, **FRANK BILLINGS**. Elected Republican United States Senator from Minnesota, Nov. 7, 1916.

**KELP**. See *FERTILIZERS*.

**KENDRICK**, **JOHN B.** Elected Democratic United States Senator from Wyoming, Nov. 7, 1916.

**KENTUCKY**. **POPULATION**. The estimated population of the State on Dec. 31, 1916, was 2,386,866. The population in 1910 was 2,289,905.

**AGRICULTURE**. The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn . . . . . 1916	3,400,000	95,200,000	\$82,824,000
1915	3,500,000	105,000,000	68,800,000
Wheat . . . . . 1916	890,000	8,010,000	13,297,000
1915	900,000	9,900,000	10,395,000
Oats . . . . . 1916	800,000	6,300,000	3,780,000
1915	250,000	6,500,000	3,120,000
Potatoes . . . 1916	49,000	4,118,000	5,845,000
1915	51,000	6,428,000	3,534,000
Hay . . . . . 1916	1,080,000	1,415,000	17,829,000
1915	900,000	a 1,280,000	15,750,000
Tobacco . . . 1916	484,000	435,600,000	55,321,000
1915	440,000	b 356,400,000	27,799,000
Rye . . . . . 1916	22,000	246,000	317,000
1915	24,000	288,000	271,000
Barley . . . . 1916	6,000	156,000	140,000
1915	6,000	180,000	139,000

a Tons. b Pounds.

**MANUFACTURES**. The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments . . . . .	4,776	4,184
Average number of wage earners . . . . .	65,400	64,586
Capital invested . . . . .	\$172,779,000	\$193,423,000
Wages . . . . .	27,888,000	31,880,000
The value of materials used . . . . .	111,779,000	114,829,000
The value of products . . . . .	223,754,000	230,249,000

**MINERAL PRODUCTION.** The coal production of the State in 1916 is estimated at 25,330,000 tons, an increase compared with 1915 of nearly 4,000,000 tons, or 19 per cent. The chief increase was in the eastern part of the State, and was largely a by-product for gas coals, but it was shared by the domestic and steam coals also.

The production of lead and zinc in 1915 was much greater than in 1914. The shipments of galena concentrates amounted to 370 tons, valued at \$17,103, compared with 26 tons valued at \$800 in 1914.

**TRANSPORTATION.** The railway mileage of the State in 1916 was 4027. The railroads having the longest mileage are the Louisville and Nashville, 1753; Illinois Central, 570; Chesapeake and Ohio, 463.

**EDUCATION.** The school population of the State in April, 1916, was 742,808. The enrollment in the schools in 1915-16 was 542,559. The average daily attendance in the public schools was 353,549. The number of teachers in 1914-15 was 12,288, of whom 8138 were women.

**FINANCE.** The report of the State Treasurer for the fiscal year 1916 shows a balance on July 1, 1915, of \$854,423. The total receipts from all sources were \$3,927,108, and the expenditures \$9,709,096. The total outstanding interest bearing warrants at the end of the fiscal year amounted to \$4,177,369. The chief sources of revenue are from insurance taxes, railroad taxes, franchise taxes, and corporation taxes. The chief expenditures are for Confederate pensions, State institutions, and State offices.

**CHARITIES AND CORRECTIONS.** The State Board of Control administers the charities and corrections. These include the Eastern State Hospital at Lexington, Central State Hospital at Lakeland, Western State Hospital at Hopkinsville, and the Feeble-Minded Institute at Frankfort.

**POLITICS AND GOVERNMENT.** The campaign in Kentucky in 1916 turned almost exclusively upon national issues. Neither in the campaign itself nor in the party conventions that preceded it did local questions arise in such a way as to overshadow the national questions. The voting on November 7th gave the Democrats a larger majority than had been the case in presidential elections in many years. This was a disappointment to the Republican leaders, who believed because of the small majority by which the Democratic State ticket had carried Kentucky in the preceding November that the State would be carried by Mr. Hughes. The Republican national committee made a special effort in Kentucky. Mr. Hughes spoke twice in the State, and Mr. Roosevelt once. As a result Mr. Hughes ran well in Louisville, but the rest of the State showed clearly the strength of Wilson and the Democratic ticket. The vote for electors was as follows: Democratic, 269,990; Republican, 241,854; Prohibition, 3036; Socialist, 4734; Progressives, 122. The Congressional election showed no changes in the Kentucky delegation. Democratic Congressmen were elected in all the districts but two.

The Democratic State convention preceding the national convention was without national contest, in that all the delegates favored the nomination of President Wilson. The anti-pro-

hibition wing of the Democratic party at that convention secured sufficient control to name the committee, but it developed during the course of the convention that this issue is yet to be fought out in the party.

At the Republican convention a new set of leaders secured control. The delegates went to Chicago instructed for Fairbanks for first ballots, but with three-fourths of them actually for Hughes. The control of the party was centered about Mr. A. T. Hert, who was made a member of the Republican national committee, and later became Western manager of Mr. Hughes's campaign. Following the election this wing of the Republican party came out strongly for State-wide prohibition. See also LIQUOR REGULATION and LEGISLATION in 1916.

On September 4th the Lincoln Memorial at Hodginsville, built over the log cabin birthplace of Abraham Lincoln, was formally presented to the nation by the Lincoln Farm Association. President Wilson delivered the speech of acceptance.

The State during the year entered upon a vigorous plan of forest conservation. The State forester took steps to acquire possession of small tracts of cheap land which had been cut over in order to demonstrate the need of conservation.

On January 25th, by a vote of 20 to 14, the State Senate defeated the Frost bill, which carried a constitutional amendment submitting State-wide prohibition to the people. It was one of the most bitterly fought contests in the Assembly in many years. The advocates of the bill lacked only 9 votes of having enough to carry the amendment.

**LEGISLATION.** The Legislature met in 1916, and amended many important measures. A record of these is given below:

The law imposing double time for second conviction of a felony, and life sentence for a third conviction was repealed. Provision was made for the employment of prisoners on roads, prison-farms, and within prisons, and for the payment of not exceeding 15 cents a day of the earnings to the prisoner's family. Cities having light or power plants are authorized to serve other cities and towns in the State. The militia law was recodified and provision was made for the calling out and organization of the reserve militia in case the national guard is unequal to an emergency. The enrollment of all able-bodied males between the ages of 18 and 45 years was authorized. The licensing of liquor dealers was regulated, and it was made a misdemeanor for physicians to divide fees. Provision was made for the analysis of food by State agencies for the enforcement of the pure food laws. An elective workman's compensation law was enacted. The laws relating to life insurance were amended, and a State insurance board was created to supervise fire insurance rates and rate-making bureaus. The jurisdiction of the railroad commissioner was extended over express, telephone, telegram, or boat companies. An anti-trust law permitting a compensation in restraint of trade was enacted.

**STATE OFFICERS.** Governor, Augustus O. Stanley; Lieutenant-Governor, James D. Black; Secretary of State, James P. Lewis; Treasurer, Sherman Goodpaster; Auditor, Robert L. Greene; Attorney-General, M. M. Logan; Superintendent



of Education, V. O. Gilbert; Commissioner of Agriculture, M. S. Cohen—all Democrats except Lewis, Republican.

**JUDICIARY.** Court of Appeals: Chief Justice, Warner E. Settle; Associate Justices, Shackelford Miller, John D. Carroll, Ernest Clarke, Gus Thomas, Rollin Hurt; Commissioner of Appeals, W. R. Clay; Clerk, R. W. Killmer.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Democrats .....	27	63	90
Republicans .....	11	37	48
Democratic majority..	16	26	42

**KENTUCKY, UNIVERSITY OF.** A State co-educational institution at Lexington, Ky. It was founded in 1866. In the fall of 1916 there were 1035 students and 100 instructors. The Peabody Fund of the university amounts to \$40,000. The library contains 31,000 volumes. President, Henry Stites Barker.

**KEPHALIN.** A preparation extracted from the brain which has the property of coagulating blood. Brain lipid, or impure kephalin, is an ether extract of the brain of the ox, or other mammal. It may be smeared on gauze sponges or pledgets and applied to bleeding surfaces. There is also a solution of brain extract known as Thromboplastin-Hess, an extract of ox brain in physiological salt solution. McLean of the Johns Hopkins University has attempted to ascertain whether the thromboplastic properties attributed to kephalin reside in the substance itself or in some impurities. The evidence presented indicates that impurities cannot account for the blood-clotting effect, for not only brain kephalin, but also a similar substance isolated from the heart and liver have the same action.

**KERENS, RICHARD C.** An American business man and ambassador, died in Merion, Pa., Sept. 4, 1916. He was born at Kilberry, County Meath, Ireland, in 1842, but was brought to this country as a child. After the Civil War, in which he served, Mr. Kerens became interested in transportation in the West. By 1872 he was moving passengers, mails, and express from the western railroad terminals across the plains to the frontier settlements, and by 1874 he had become contractor for the Overland Mail service of stage coaches. After living for some years at San Diego, Cal., he returned as far east as St. Louis, where he made his home thereafter, identifying himself with railway interests in the Southwest and with Republican politics. From 1884 he was active in the higher councils of the party, as member of the National Committee and of the National Executive Committee. After twice being defeated for a seat in the United States Senate, Mr. Kerens was appointed by President Taft ambassador to Austria-Hungary in 1909. This office he held for four years. The *Lætare* medal, conferred by the University of Notre Dame (Indiana) on distinguished American Catholic laymen, was awarded to him in 1904. He was reputed to be very wealthy.

**KEYES, HENRY W.** Elected Republican Governor of New Hampshire, Nov. 7, 1916.

**KIAOCHOW.** A German protectorate on the east coast of the Chinese province of Shantung occupied by the Japanese in 1914. It consists of

a harbor, town (Tsingtao), and district, which were seized by Germany in November, 1897, leased by Germany from China for 99 years from March 6, 1898, and declared a German protectorate April 27, 1898. The area, exclusive of the bay, is 552 square kilometers (213 square miles). Population, about 195,000, including: Chinese, about 187,000; other colored, 3000; white (Jan. 1, 1913), 4470, of whom Germans, 4256. In April, 1915, Japanese residents (exclusive of the military) numbered 9264. Imports and exports (including hinterland trade passing through Tsingtao) were valued at 14,938,000 and 80,295,000 marks respectively in the fiscal year ended Sept. 30, 1912; in the fiscal year 1913, 121,254,000 and 79,640,000. There came from China in 1912 imports to the value of 47,880,000 marks; in 1913, 32,439,000. Principal exports in the fiscal years 1912 and 1913, in thousands of marks: straw braid, 33,398 and 17,590; peanuts, 10,380 and 11,382; Shantung pongees, 4058 and 8009; yellow silk, 6479 and 7507; peanut oil, 7018 and 7187; raw cotton, 3425 and 5612; cattle hides, 1770 and 3169; bean oil, 2389 and 2756; cattle, 1511 and 2671; coal, 2573 and 2593; silk waste, 2185 and 1062. There were entered at Tsingtao, in 1913, 923 vessels (exclusive of junks), of 1,298,622 tons. The Shantung Railway, 434 kilometers (270 miles) in length, extends from Tsingtao to Tsinan, capital of Shantung, with a branch from Changtien to Poshan. The budget of the protectorate for 1914-15 was continued for 1915-16; it balanced at 18,411,590 marks, 8,064,601 marks being the estimated local receipts, 9,988,602 marks imperial contribution, and 1,358,387 marks treasury balance.

On Aug. 27, 1914, Japan began the blockade of Tsingtao, which surrendered to Japanese and British forces on November 7th following. The protectorate has since been administered by the Japanese. See GERMAN PROTECTORATES.

**KING, BASIL.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, American.

**KING, GRACE.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, American.

**KING, WILLIAM FREDERICK.** A Canadian surveyor and astronomer, died at Ottawa April 23, 1916. He was born at Stowmarket, Suffolk County, England, in 1854, came to Canada in early youth, and was educated at the University of Toronto. After working for some years on Dominion land surveys in the Northwest he became government inspector of surveys and chief inspector in 1886. In 1890 he became chief astronomer of the Department of the Interior, in 1905 director of the Dominion Astronomical Observatory, and in 1909 superintendent of the Dominion Geodetic Survey. In 1904-07 he was a member of the International Waterways Commission, and a commissioner for the international boundary between the United States and Canada under the several treaties relating thereto. In 1908 he was made a C.M.G. He was elected president of the Royal Society of Canada in 1911. He published *Astronomy in Canada* and many other scientific papers.

**KING, W. H.** Elected Democratic United States Senator from Utah. Nov. 7, 1916.

**KIRBY, WILLIAM FOSGATE.** Elected Democratic United States Senator from Arkansas, Nov. 7, 1916.

**KIRCHHOFF, CHARLES WILLIAM HENRY.** An American technical editor, died at his sum-

mer home in Asbury Park, N. J., July 23, 1916. He was born in 1853 in San Francisco. At 21 he graduated as mining engineer and metallurgist from the Royal School of Mines at Clausthal, Germany. From 1877, when he became assistant editor of the *Metallurgical Review*, until his retirement in 1910, he devoted himself to journalistic work, although at the same time serving as vice-president and general manager of the David Williams Company of New York. In earlier life he was connected with the *Iron Age* and the *Engineering and Mining Journal*, returning to the former periodical, of which he was editor in chief from 1889 to 1910. From 1883 to 1906 Mr. Kirchhoff was also a special agent of the United States Geological Survey for the collection of statistics on the production of lead, copper, and zinc. A recognized authority on the iron and steel industry of the country, he was often consulted by Andrew Carnegie and other leaders. Twice he held the presidency of the American Institute of Mining Engineers (1898-99 and 1911-12), and he was elected a member of the Iron and Steel Institute of Great Britain and honorary member of the Franklin Institute, Philadelphia. *Notes on Some European Iron Districts* was published by him in 1900.

**KIRCHWEY, GEORGE W.** See PENOLOGY.

**KITCHENER OF KHARTUM, HORATIO HERBERT**, first Earl. A famous British soldier and administrator, drowned at sea June 5, 1916, when the cruiser *Hampshire* was sunk by a German mine off the West Orkney Islands. He was on his way to Russia on a military mission. The son of a soldier, Lieut.-Col. H. H. Kitchener, Lord Kitchener himself was all his life identified with military affairs. After the death of Lord Roberts, he was without peer as the greatest British soldier of his time. Although both his parents were English, he was born in Ireland, in County Kerry, June 24, 1850. He studied under tutors in Switzerland and London, and at Woolwich Military Academy, obtaining a commission in the Royal Engineers in 1871. For a short time before this, he served in the French army under General Chanzy, in the Franco-Prussian War, having enlisted while on a visit to his father at Dinan. In 1874 he joined the staff of the Palestine Exploration Society, and for four years was engaged in survey work in the Holy Land. Later similar work in Cyprus resulted in a new map of that island.

During service in the Egyptian campaign against Arabi Pasha (1882), Kitchener was able to make himself so useful, partly because of his ability to speak Arabic, that he was soon second in command of the Egyptian cavalry. Two years later he accompanied part way the fruitless expedition under Sir Herbert Stewart, sent to the relief of General Gordon at Khartum. During the next few years, from 1886 as governor-general of the Red Sea littoral and commandant at Suakim, he was principally occupied in the suppression of the Emir Oman Digna. It was at this time, in the battle of Handub, that he received his first and only wound, a bullet wound in the neck. Colonel and aide de camp to Queen Victoria, adjutant-general (1892), sirdar (commander) of the Egyptian army, and knighted, K.C.M.G. (1894)—this is the record that leads up to the first great period in his career.

The feat for which Kitchener became best known was the reconquest of the Sudan, avenging the death of General Gordon, and rescuing the country from the despotic rule of the Mahdists, with the Khalifa at their head. His march through the desert to Khartum, building a railroad as he went, is one of the most extraordinary achievements in British military history. Obstacles generally supposed fatal to such an expedition were surmounted, and the whole enterprise proved to be the best example of Kitchener's relentless energy, executive genius, and power to grasp a situation in all its aspects, economic and social as well as military. His preparatory work began in 1896; Khartum fell Sept. 2, 1898. During all this time the dervishes were gradually being driven back. They were surprised at Firket, and battles were fought at Hafir and Dongola, and the latter place occupied. A railroad was to be pushed 230 miles across the desert from Wady Halfa to Abu Hamed, and then on still farther. After 130 miles had been built, a flying column advanced and captured Abu Hamed and Berber. The first great battle was that of the Atbara, April 8, 1898. The dervishes lost 1700 killed, and of their leaders, Osman Digna and Mahmud, the latter was captured. The Anglo-Egyptian casualties numbered only 551. As the British came within sight of Khartum, they were engaged by the enemy, 52,000 strong, at Omdurman, on the bank of the Nile. In the spectacular battle that then took place (September 2nd), 10,700 dervishes were killed and twice as many wounded, while the British lost only 386 men. The Khalifa escaped but was slain in a later battle. Khartum was occupied, and the next day a memorial service was held in the garden of Gordon's house.

Immediately thereafter, Kitchener had to do his part to relieve the embarrassing situation caused by the fact that General Marchand had arrived from the West at Fashoda, up the river, and expected to claim the country for France. Upon his return to England the conqueror of the Sudan was acclaimed a hero. He was made Baron Kitchener of Khartum (he was afterward often spoken of as "K. of K."), received the thanks of both houses of Parliament, and the G.C.B., and was given a public grant of £30,000.

With but a short rest, and after merely beginning important constructive work in the Sudan, he was sent, at the end of 1899, to South Africa, to be chief of staff to the newly appointed commander in chief, Lord Roberts. During this period he showed that even with a great achievement to his credit, he could serve as a subordinate. Little was heard of him till it was supposed that the Boers had been effectually subjugated. The command was handed over to him in November, 1900. From then till the final peace of May 31, 1902, as it turned out, Kitchener had to use all his energy and resourcefulness to get the upper hand. Raids by guerrilla bands continued to be troublesome. The army had to be brought to a higher state of efficiency, and the commander was inexorable, as he always was, in his discipline. The Boers, under De Wet and other leaders, invaded Cape Colony early in 1901. The final British victory was achieved not by great battles, but by the creation of a chain of blockhouses, which eventually trapped the

enemy as in a net. Of this scheme of campaign Kitchener was the author. When he returned to England, he was promoted to viscount, and given the Order of Merit and a grant of £50,000.

Within a few months the government again called on him, this time to be commander in chief in India. During the seven years that he held this post, he put through a series of notable reforms in the organization, disposal, and equipment of the army, bringing it to a condition where it would be ready for efficient service in case of war. Only after journeys of inspection that covered 1500 miles and many consultations with army officers, was the commander convinced of the need for rigorous revision of the system. His plan brought him into sharp conflict with Lord Curzon, the Viceroy, when Kitchener insisted on a new army department that would leave him a freer hand. The British cabinet upheld Kitchener and Curzon resigned in 1905.

In 1909, on giving up his Indian post, Kitchener was made a field marshal. Before returning to England, he visited Australia, having been invited to give his advice regarding the defense of that commonwealth. His lengthy report on conditions evidenced the thoroughness that was his chief watchword. It was the highest praise that he could find for the United States Military Academy at West Point, which he visited shortly afterward, that it was "thorough," superior in that quality to any military school in Europe. On his advice it was taken as the model for a new Australian academy.

Except that for a short time he held a sinecure, which he never desired, the post of high commissioner and commander in chief in the Mediterranean, Lord Kitchener's next work was again in Egypt, whither he went in September, 1911, as British agent and consul-general. The country at that time was in a state of unrest, because of a religious controversy, political plots, and seditious newspapers; but it soon found that Kitchener would tolerate no disorders. A particularly delicate situation had to be met during the Turco-Italian War and the two Balkan wars, because of colonies of Italians and Greeks in Egypt, and sympathy of Egyptian Mohammedans for their Turkish coreligionists. Kitchener's blunt and dictatorial control, tempered when necessary by an effective diplomacy, saved the day. More than this, he saw the need for constructive reforms, and at once entered on a scheme for far-reaching improvements in irrigation and agriculture. He also greatly furthered the increase of military facilities, roads, etc.

When the European war broke out in the summer of 1914, Kitchener had come to England to accept an earldom. On the entrance of Great Britain into the war, a great popular demand was made for him as Secretary for War. On August 5th he received the appointment, the first soldier with no cabinet experience ever to hold the post. From this time till his death, the building up of an army able to save the country was his whole concern. The story that he had no sooner been appointed than he hurried over to the War Office and demanded that a bed be brought in so he could be there night and day, is significant. It shows the way he did things. Probably better than any other man in the British Empire he realized what the war would mean. He was not to be stampeded into

hasty measures that might bring quick victories and then swift collapse. He seems to have seen that only the deliberate, unflagging, cumulative organizing methods that he had always relied on would bring permanent results. He stated that he believed the war would be likely to last three years. His was the problem of building up at home out of raw material a great army that could effectively support the 200,000 men first sent to France. He long relied wholly on volunteers, and it was only as a supplementary measure that conscription was finally resorted to. Eventually much criticism was aroused, especially by disclosures that the British army in France was not being adequately supplied with munitions. It became evident that more than any one man could carry and more than any other man would have tried to carry had been placed on the shoulders of the War Secretary. Lloyd George was then made Minister of Munitions, and Lord Derby was given charge of recruiting. That Kitchener raised and trained for service some 5,000,000 men, secured the immense sums of money necessary for equipment and the myriad expenses of such an enterprise, and whipped industrial England into a condition capable of meeting, later if not sooner, the demands upon it—these achievements will never be forgotten.

Kitchener visited France several times and even journeyed to Gallipoli, which, on his advice, was afterward evacuated. When he lost his life, he was on his way to Petrograd to discuss important military and financial questions with the Emperor Nicholas. In being made Knight of the Garter in 1915, he received the highest honor that can be bestowed on an Englishman. His loss caused profound sorrow throughout the British Empire. Various memorial services were held, the chief one (in St. Paul's, London) attended by the King and Queen and Queen-Mother. Kitchener's title passed to his brother.

It is impossible in a short sketch to say more than a few words about the personality of this remarkable man. His imposing physique and carriage, his uncompromising face, and his brusque manner had combined to build up a popular idea of him as a "machine," calculating, unresponsive. This view may do him injustice. He was also generally thought to be a "woman hater"—he never married, nor would he tolerate married officers under his command, and he did not care for social life. He never spared himself and he never spared his soldiers. Consequently, he won admiration but not affection. Even when, as on several occasions, he narrowly escaped death, twice at the hands of assassins and once in the first line of trenches in France, people were not greatly moved. At last, however, his tragic death seemed to crystallize in the public mind a conception of what "K. of K.," in his 48 years of devoted and distinguished service had done for the British Empire, and he was mourned as a friend as well as a hero. In 1916 was published *Lord Kitchener*, by Ernest Protheroe (London). A noted book on Kitchener, recently reprinted, is G. W. Stevens's *With Kitchener to Khartum*.

**KNAPP, CHARLES WELBOURNE.** An American newspaper owner, died in New York City Jan. 6, 1916. Of a family noted for distinction in journalism, he was born in St. Louis in 1848, and after graduating from St. Louis University in 1865, taking his A.M. there, and graduating

in law from the University of Kentucky, he became a reporter on the *Missouri Republican*, his father's paper. Later he edited the *Weekly Republican*, then had charge of the *Republican's* Washington bureau, and in 1887, shortly before the name was changed to *St. Louis Republic*, became president of the corporation publishing the paper. This post he held until December, 1915, when he resigned to accept the office of treasurer of the *New York Times*. Mr. Knapp had just taken up his new duties the following month, when he died of apoplexy at his desk. While he was publisher of the *Republic*, it led in a campaign to force the Union and Central Pacific railroads to keep faith with the government in the matter of certain contracts (1894 and 1897). A founder, and member of the board of directors and of the executive committee, of the Associated Press, Mr. Knapp had been president of this organization in 1900; and he had also been president of the Newspaper Publishers' Association, which he helped to found.

**KNIGHT, WILLIAM ANGUS.** A British philosophical and literary scholar, died at Keswick March 4, 1916. He was born at Modrington, Scotland, in 1836, was educated at Edinburgh University, and from 1876 to 1902 was professor of moral philosophy at St. Andrews, serving also as examiner to that and other universities. Glasgow gave him the honorary degree of LL.D. Professor Knight published a large number of works, of which many have to do with William Wordsworth, including editions of the poet's works, transactions of the Wordsworth Society, works of Dorothy Wordsworth, a history of Dove Cottage, letters of the Wordsworth family, and biographical contributions. He wrote, besides, many volumes on philosophical, literary, and religious subjects, and the year before he died had published two series of *Poems on the War*.

**KNOX, PHILANDER CHASE.** Elected Republican United States Senator from Pennsylvania, Nov. 7, 1916.

**KOERBER, ERNEST VON.** See AUSTRIA-HUNGARY, *History*.

**KOREA, or CHOSEN.** Formerly an independent monarchy of eastern Asia occupying the peninsula between the Yellow Sea and the Sea of Japan; now a part of the Empire of Japan. The Japanese established a protectorate over Korea March 2, 1906, and annexed the country Aug. 29, 1910. Capital, Seoul.

**AREA, POPULATION, ETC.** The area is stated at 14,123 square ri (84,606 square miles). Estimated population in 1914, about 15,509,000. The urban prefecture of Seoul has over 300,000 inhabitants, as compared with 256,381 in 1911. Fusan had, in 1911, 81,438 inhabitants; Kwangju, 42,910; Pingyang, 39,769; Haisyōng, 38,025; Taiden, 32,822; Taiku, 31,140; Chemulpo (the port of Seoul), 26,187; Wōnsan, 20,093. The Japanese population at the end of 1913 numbered 271,591 (146,215 males, 125,376 females), and the foreign population, mostly Chinese, 17,349 (15,892 males, 1,457 females). In recent years there has been a considerable immigration of Japanese, while numerous Koreans have withdrawn to neighboring Russian and Chinese territory. Ancestor worship prevails throughout the country although Christian missions have made noteworthy progress.

Schools in 1914: Japanese: primary, 199 schools, with 826 teachers and 24,915 pupils; other, 21, with 204 teachers and 2465 pupils.

Native: 388 public schools, with 1705 teachers and 49,232 pupils; other schools for natives, 1298, with 3323 teachers and 59,855 pupils.

**PRODUCTION, COMMERCE, ETC.** The only important industry is agriculture, but cultural methods are primitive. Transportation facilities are inadequate although under Japanese administration improvements are being made. The leading crops include rice, wheat, millet, and other cereals, beans, peas, tobacco, hemp, cotton, and ginseng. The reported area under rice in 1913 was 1,044,667 cho (1 cho = 2.45 acres); wheat, 694,960; millet, 464,650; cotton, 57,879; tobacco, 19,641. Sericulture is practical, and stock raising is of some account. The number of cattle in 1913 was 1,211,011; horses, 50,652; goats, 10,456; swine, 761,186. The mineral output was valued at 6,640,171 yen in 1912 and 8,110,412 in 1913, including: gold, 4,579,963 and 5,639,437; coal, 546,388 and 574,526; silver, 15,089 and 18,237. Fisheries products in 1912, 12,619,356 yen; in 1913, 11,056,283.

Imports and exports of merchandise have been valued as follows, in thousands of yen:

	1911	1912	1913	1914	1915
Imps. ....	54,088	67,115	71,580	63,231	51,604
Exps. ....	18,857	20,986	20,879	84,389	61,370

The largest import is cotton cloth and yarn, amounting to 23,010,444 yen in 1913 and 20,025,032 yen in 1914. Rice and other food grains constitute the chief export, valued at 20,691,710 yen in 1913 and 21,757,933 yen in 1914. The gold export in 1913 was 9,972,515 yen. Imports from and exports to Japan in 1914, 39,046,962 and 28,587,019 yen respectively; China, 7,760,909 and 4,518,021. Imports from the United States in 1914, 6,127,035 yen, and from the United Kingdom, 5,434,130.

The railways in Korea are state owned and are controlled by the Railway Bureau of the Government General of Chosen. The total length open to traffic in 1916 was 1006 miles, of which 366 miles had been constructed since the annexation. The Seoul-Antung Line (309.7 miles) and Seoul-Fusan Line (247.9 miles) formed the trunk line while the other lines were branches and served as feeders to bring the trunk line into connection with important coast towns. The railways are of standard gauge, and rails weigh 76 pounds per yard in the case of the main line and 65 pounds in that of the branches. Telegraph line, in 1914, 4734 miles, connecting with the Japanese and Chinese systems. Post offices, in 1913, 559; in 1914, 583.

The monetary unit is the Japanese yen; its par value is 49.846 cents. Revenue and expenditure in the fiscal year 1914 amounted to 62,359,686 and 53,454,484 yen respectively. The budget for the fiscal year 1915 balanced at 59,412,966 yen; for 1916, 59,370,500 yen. Deficits in local receipts are covered by loans or by contributions from the Japanese government.

Korea is administered by a Japanese governor-general.

**KULPE, OSWALD.** A German philosopher and psychologist died in Munich in 1916. He was born at Candau in 1862 and in 1879 graduated from the gymnasium at Libau, where he was an instructor for the next two years. He afterward studied in the universities of Leipzig, Berlin, Göttingen, and Dorpat, returning to Leipzig University, where he took the degree of

Ph.D. in 1887, and four years later was made privat-docent in philosophy. In 1894 he was appointed professor of philosophy and æsthetics at Würzburg, in 1909 professor of philosophy at Bonn, and in 1913 professor of philosophy at Munich. He was the leading expositor of the act-psychology of the Würzburg school, and made important contributions to the theory of knowledge and to the psychology of feeling and thought. He wrote: *Grundriss der Psychologie* (1893; Eng. trans., 1895 and later); *Einleitung in die Philosophie* (1895; 6th ed., 1913; Eng. trans., 1913); *Philosophie der Gegenwart in Deutschland* (1902; 5th ed., 1911); *Immanuel Kant* (1907; 3rd ed., 1912); *Psychologie und Medizin* (1912); *Die Realisierung* (1912).

**KUWDISTAN.** See WAR OF THE NATIONS.

**KWANGCHOW-WAN.** A territory on the coast of the Chinese province of Kwantung, leased by China to France for 99 years from April 11, 1898. It forms a division of French Indo-China.

**KWANTUNG, or KWANTO.** A Japanese leasehold in the southern part of the Liaoting Peninsula, Manchuria. Area, 1221 square miles. Population at the end of 1913, 595,594, as compared with 570,421 at the end of 1912. These figures include residents of Kwantung who were in Manchuria. In 1913 there were 27 Japanese primary schools, with 213 teachers and 6745 pupils, 33 other Japanese schools, with 317 teachers and 3626 pupils, and 7 public schools for natives, with 69 teachers and 2215 pupils. Since July 1, 1907, Kwantung has formed a customs district under the Chinese Maritime Customs, Dairen (formerly Dalny) being the chief port. Trade, which is largely with Japan, amounted in 1913 to 49,401,831 yen imports and 60,292,497 yen exports; in 1914, 48,250,553 and 56,943,093. There are about 80 miles of railway open to traffic, connecting with the Manchurian systems. The budget for 1914-15 balanced at 4,444,319 yen; for 1915-16, 4,324,012 yen. Kwantung is administered by a governor-general, resident at Ryojun (formerly Port Arthur).

**LABBÉ, Léon.** A French surgeon and legislator, died in Paris March 21, 1916. Born at Merlerault, Orne, in 1832, and a graduate, in 1861, of the Faculty of Medicine, Paris, Labbé became surgeon to various hospitals, and was actively engaged in practice for about 30 years. In 1892 he entered political life, serving as Senator for the Department of Orne, and as president of the Department Council. He was a member of the Institute of France and of the Academy of Medicine, of which he was president in 1909, and a commander of the Legion of Honor. Labbé advanced various hygienic measures, the most important being that making compulsory in the army anti-typhoid vaccination. One of his notable achievements was the removal of a fork from a man's stomach.

**LABOR.** Like its predecessor, the year 1916 was marked by continued improvement of wages and hours of labor in the United States. The same may be said in a general way of most other countries, even those at war, and industrial conditions were particularly favorable in Japan and Australia. While there was consequently less marked agitation by the extremely radical labor groups, such as the Industrial Workers of the World (q.v.) and the advocates of Syndicalism, the year was nevertheless marked by

some very momentous labor disputes. (See STRIKES AND LOCKOUTS.) In consequence of a threatened railway strike during the fall the subject of compulsory arbitration of labor disputes, particularly those relating to interstate commerce and the public utilities, was extensively discussed. For this and other proposals for the maintenance of industrial peace see ARBITRATION AND CONCILIATION, INDUSTRIAL. In line with the agitation of the last few years the entire subject of SOCIAL INSURANCE (q.v.) was considered in its various aspects as treated under LABOR LEGISLATION, AMERICAN ASSOCIATION FOR; OCCUPATIONAL DISEASES; OLD-AGE PENSIONS; UNEMPLOYMENT; WORKMEN'S COMPENSATION. The subjects of MINIMUM WAGE (q.v.) and PENSIONS FOR MOTHERS (q.v.) made less progress as regards legislative results than in the two years preceding. In the article on TRADE UNIONS will be found a statement of the progress of the organized labor movement throughout the world. For other matter relating to labor problems, see AGRICULTURE; CHILD LABOR; LABOR, AMERICAN FEDERATION OF; LABOR LEGISLATION; PRICES; and WOMEN IN INDUSTRY.

**SEARS ROEBUCK AND COMPANY.** A profit-sharing scheme with some unique features was inaugurated July 1st by Sears Roebuck and Company of Chicago. The plan provided that the company would contribute annually 5 per cent of its earnings before dividends were declared to an Employees' Savings and Profit-sharing Fund. Any one employed three years in the company's service may participate. The plan thus was very democratic in scope, affecting 6000 or more employees. Each participant must deposit 5 per cent of his salary, neither more nor less, except that no employee can contribute more than \$150 per year. The contribution of the company will be apportioned among the participants in the proportion which their contributions individually bear to their total contribution. The fund will be administered by a board of five trustees, two of whom shall be employees. The company reserves the privilege of discontinuing the arrangement upon six months' notice. After 10 years of service a participant may withdraw his share of the accumulations. The same privilege is extended to women who, after five years' service, resign to get married, and to the heirs of any participant who dies. Employees who do not complete 10 years of service may withdraw their own contributions plus interest at 5 per cent compounded semi-annually. It was estimated that the contribution of the company would approximate \$550,000 per year; and of employees \$287,406. An employee earning \$20 per week and contributing \$1 per week to the fund would have to his credit at the end of 15 years \$3428; after 20 years \$5253; and after 30 years \$10,556.

**UNITED STATES.** The developments of greatest interest to labor in the United States were included in the enactment of the eight-hour day for railroad employees by Congress (see *Adamson Law* under ARBITRATION AND CONCILIATION, INDUSTRIAL), and other less notable achievements of the eight-hour day partly by strikes and partly through the extension of State eight-hour laws; the very considerable and wide-spread advance in wages taken in conjunction with steady employment with much overtime and a complete removal of unemployment (q.v.) as a pressing

social problem; the very marked advancement in public opinion with reference to social insurance (q.v.); and the continued progress in legislation protecting women and children in industry. The wage advances reached every employment and in many cases were fairly substantial, amounting for many hundred thousands of laborers to at least a 10 per cent increase. Many of these increases came toward the close of 1916 and were accompanied by special bonuses at Christmas time, benefiting at least several million workers, and by an unprecedented volume of group insurance (see under INSURANCE). Thus in November the United States Steel Corporation announced a 10 per cent advance for about 250,000 workers; the American Woolen Company a similar advance for 35,000 employees; various cotton mills in New England paid an equal advance to 33,000 operators; other steel companies employing at least 60,000 men announced 10 per cent increases in November. In December bonuses of 4, 5, to 10 per cent were announced by leading railroads, banks and trust companies, paper manufacturers, and numerous other employers. The American Telephone and Telegraph Company about December 1st announced that it would distribute \$6,000,000 among its employees, directly in proportion to length of service and inversely as to size of wages. The Eastman Kodak Company announced a distribution of \$1,000,000 among 8000 of its employees, this being 3½ per cent of annual pay for each year of service up to five years. The Crane Company of Chicago announced a distribution of \$700,000. The Standard Oil Company of New Jersey made successive advances in wages totaling 37 per cent from August, 1915, to December, 1916. The foregoing are only a few instances of a very widespread movement. For organized labor in the United States see LABOR, AMERICAN FEDERATION OF; and TRADE UNIONS.

DEPARTMENT OF LABOR. An important modification was sought in the organization of the Department of Labor by the bill introduced by Congressman Casey of Pennsylvania and Senator Jones of Washington providing for the establishment of a woman's division. The bill required this division to investigate matters pertaining to the welfare of working women, their competitive influence, and the effects of industrial employment on their health and home-life. The bill was endorsed by Secretary of Labor Wilson, who stated his belief that many phases of the employment of women could be more effectively handled under the direction of women than under the direction of men.

The Bureau of Labor Statistics continued its extensive investigations and its informing publications. The *Monthly Review* begun in 1915 contained information regarding labor conditions throughout the world. In addition publications were made in the following series of bulletins: *Wholesale Price, 1890-1915*; *Retail Prices 1907-December, 1915*; *Street Railway Employment in the United States*; *The British System of Labor Exchanges*; *Dressmaking as a Trade for Women*; *Proceedings of the Third Annual Conference of, and Proceedings of the Conference called by, the International Association of Industrial Accident Boards and Conferences*; *Causes of Death by Occupations*; *Anthrax as an Occupational Disease*; *Hygiene of the Printing Trades*; *Collective Agreements in*

*the Men's Clothing Industry*; *Labor Legislation of 1916*; *Vocational Education Survey of Minneapolis*; and *Profit-sharing in the United States*.

GREAT BRITAIN. In the early part of the war there was most bitter criticism of the attitude of British labor toward the tremendous problems raised by the international conflict. Trade unionists especially were accused of shirking, sabotage, drunkenness, engaging in strikes to delay and disorganize production, and otherwise conducting themselves in an obstinate manner. However, through legislation and tactful management on the part of Lloyd George and other governmental officials the favor of trade union leaders was won and gradually a greatly improved attitude became evident throughout the ranks of labor. The various charges against labor were thereafter widely refuted. Thus from Glasgow, Birmingham, Newcastle, Barrow-in-Furness, Sheffield, and other great industrial centres came uniform reports that drunkenness had diminished, that both men and women were coöperating loyally in production, that they were generally working long hours with much overtime, and otherwise showing full appreciation of the great responsibilities which national safety imposed upon them. This change was reflected by the pledge of the 850 delegates to the Trade Union Congress at Bristol in September to assist the government so far as was within their power with the successful prosecution of the war.

The munitions ministry instructed its committee on health of munitions workers to investigate and report on various aspects of employment in munitions factories. Ten of these reports were issued on the following subjects: Sunday labor; welfare supervision; industrial canteens; employment of women; hours of work; canteen construction and equipment; industrial fatigue and its causes; special industrial diseases; ventilation and lighting; sickness and injury. In various of these reports it was made evident that the hours and continuity of labor required by war industries were as great as those in the early days of the factory system. Large numbers of workers were found to be employed more than 70 hours per week; 12-hour shifts were common; in some cases shifts of 18 hours were found, while shifts of 13 and 14 hours were not unusual; Sunday labor was the rule. The great influx of workers in some sections had overtaxed housing accommodations so that the same beds were used night and day; family life was almost completely destroyed; large numbers of boys and girls as well as unprecedented numbers of women were employed; and excessive fatigue and undernourishment were pictured as widely existent. One report stated that the consumption of liquor in some places was directly connected with an insufficiency of cheap good food. In consequence of these conditions inefficiency was universal. It was indicated that, although many women were employed in 12-hour shifts, managers generally believed four hours to be the longest period during which a woman could work continuously at full vigor. Consequently three shifts of eight hours each were recommended. In this connection it was pointed out that the excessive night employment of women constituted a return to conditions long since abolished by law during times of peace. Industrial injuries were astonish-

ingly frequent. These reports indicated that the problems of English labor in war time involved not merely far-reaching problems of national, industrial, and military efficiency, but also the future health and vigor of the working population. That the gravity of the situation was largely appreciated was shown by numerous rules and regulations for the care of all classes of workers, and especially for women and children. See **WOMEN IN INDUSTRY**.

**LABOR, AMERICAN FEDERATION OF.** This organization, founded in 1881, has long been the largest and most powerful body of organized labor in the United States, and one of the largest in the world. At its annual convention at Baltimore, Nov. 13-25, 1916, its membership was reported as 2,072,702, organized in 21,711 local unions. Most of these unions were grouped under 111 national and international (United States and Canada) unions; there were 717 central bodies, 45 State federations, 705 local trade or federal labor unions, and 417 local department councils. These latter were organized under the five major departments of the Federation, namely, building trades, metal trades, mining, union label, and railroads. Nearly 1800 organizers were in the field to strengthen trade union bodies and to organize new groups. The income for the year ending September 30th was \$334,275; expenses, \$315,047. The organizations comprised granted during the year the following benefits: for death of members, \$2,264,611; for death of members' wives, \$163,662; for sickness, \$1,068,609; for unemployment, \$120,771. The strikes of the year included 1135 that were won, 133 compromised, 49 lost, and 305 pending; their total cost was \$2,708,789 expended in strike benefits by unions on strike plus \$154,010 in financial aid from other unions.

The annual convention approved a report of the executive council, in which the movement for social insurance was reviewed and the recommendations made that all unions give this movement extended consideration, and that, wherever established such insurance be voluntary rather than compulsory. Vigorous resolutions condemned compulsory insurance of any kind and the entrance of private companies into any sort of industrial, health, or social insurance. A movement was begun in favor of the enactment of old-age pension laws by Congress and by the various legislatures; in the same connection other resolutions called upon the executive council to review the old-age pension experience of Germany and Great Britain, and to urge the establishment of a retirement system for Federal civil employees "which will not either directly or indirectly cause them to suffer a reduction in wages during employment."

The convention favored the establishment in the Department of Labor of a bureau of safety to include not only industrial accidents but also vocational diseases. It asked Congress to investigate the subject of speculation in foods, and to place an embargo on food exports. The executive council was requested to appoint a committee to study and report on methods of cooperative production and distribution. Resolutions were adopted urging equal pay for equal work regardless of sex and the enactment of the Nolan bill providing a minimum wage of \$3 per day for every one after two years in the Federal civil service. While there was much favor expressed in the discussion for securing the eight-

hour day by legislative enactment, and while all unions were urged to work for this length of day by union methods, the convention referred the question of the eight-hour day by legislation to a special committee to be appointed by President Gompers. The latter had on various occasions expressed opposition to the use of political methods in securing the eight-hour day, preferring to secure it by industrial pressure. President Wilson's legislative programme, set forth at the time of the enactment of the Adamson Law (see **ARBITRATION AND CONCILIATION, INDUSTRIAL**) was fully reviewed and strenuous opposition taken to any measure of compulsion. This viewpoint was later expressed by various leaders in their discussion of the proposal for compulsory investigation of trade disputes.

For many years the Federation has sought the enactment of laws prohibiting the application of anti-trust legislation to trade unions. Consequently the convention urged the importance of securing the enactment of State laws "supplementing the freedom and rights established under the Clayton Antitrust Act." In this act it was declared that "the labor power of a human being is not a commodity or article of commerce"; while the exact bearing of this clause has not yet been judicially determined, the Federation leaders look upon it as a great safeguard of the freedom of labor to organize. Another matter of first importance in the recent history of the Federation has been its unrelenting opposition to the unrestrained use of injunctions in labor disputes. A report was unanimously approved in which was reviewed a decision of the Massachusetts Supreme Court declaring unconstitutional an anti-injunction law of that State; in which was urged either constitutional amendment or the right of recall of judicial decisions to secure redress in such cases; and in which it was declared "that any injunction dealing with the relationship of employer and employee and based upon the dictum that 'labor is property' be wholly and absolutely treated as usurpation and disregarded, let the consequences be what they may." The action of the Federation officials in preventing the application of the Taylor system to government shipbuilding yards was commended. Other resolutions declared in favor of an extension of industrial training, free text books, popular election of school boards, the right of teachers to organize, to permanent tenure on the basis of merit, to higher salaries, and to retirement pensions. Steps were taken to cultivate friendly relations with organized labor in Mexico, South America, and Japan.

On March 28th President Gompers sent a circular letter to the "Organized Labor Movement of all Countries" proposing that a world's labor congress be held at the time of peace deliberations at the close of the European war. The 1915 convention had voted to set aside Jan. 27, 1916, as Hatters' Day, on which each of the 2,000,000 members would devote one hour's wage to meet the fine of \$252,000 imposed by the courts upon the Danbury Hatters' Union for prosecuting an illegal boycott. However, only \$132,000 was paid in; hence the officials on May 9th issued an urgent appeal for the collection by local bodies of the remainder of this fund.

**LABOR EXCHANGES.** See **UNEMPLOYMENT**.

**LABOR LEGISLATION.** During 1916 only

a few State legislatures met, consequently the volume of labor legislation was relatively small. The more important labor laws will be found mentioned under the following headings, ARBITRATION AND CONCILIATION, INDUSTRIAL, where is treated the *Adamson Law*; CHILD LABOR; MINIMUM WAGE; OLD-AGE PENSIONS; SOCIAL INSURANCE; UNEMPLOYMENT; WOMEN IN INDUSTRY; and WORKMEN'S COMPENSATION.

**ADMINISTRATION.** The most important changes in labor law administration were those effected in Maryland and New Jersey. In the former State a Board of Labor and Statistics succeeded the Bureau of Statistics and Information. The new board is composed of three commissioners appointed by the Governor for two years. The chairman will receive \$2500 per year, and the other two, who are advisory members, \$500, in addition to necessary expenses. The new board is given the powers of the former bureau, including the collection of information regarding labor troubles, agricultural developments, mining and manufacturing, trade and transportation. It is to enforce the law regarding the employment of women, regarding health regulations, and regarding mothers' pensions. It is required to establish employment agencies and to investigate unemployment. In Massachusetts the State Board of Labor and Industries was given sole responsibility for the prevention of industrial accidents and occupational diseases, duties formerly shared with the Industrial Accident Board. The minimum wage law was so amended as to require that the commission must be composed of one employer of women, one woman, and one representative of labor. New Jersey reorganized its Department of Labor. The new department consists of a commissioner, assistant commissioner, bureaus of instruction, structural equipment, electrical equipment, hygiene and sanitation, engineers' and firemen's licenses, industrial statistics, and employment. The commissioner is appointed for five years at \$6000 a year; the assistant heads and investigators receive variously \$1500, \$2000, and \$2500. A Workmen's Compensation Aid Bureau was created, and various modifications were made in the rules for granting child labor certificates.

In New York City supervision of building operations was given to the Borough Superintendents of Buildings, subject to a Board of Standards and Appeals; and the Tenement House Department was given the regulation of bakeshops and confectioneries in tenement houses, this authority having been previously exercised by the Health Department.

**HOURS.** Massachusetts and New York passed very minor modifications in laws relating to the labor of public employees and persons engaged on public works. Louisiana eliminated from the law regarding the work of women and children, the exception in favor of mercantile establishments for the 20 days before Christmas, and limited Saturday night exemptions to stores employing more than five persons. In Maryland the posting of those sections of the child labor law relating to children under 16, together with the hours of commencing and stopping work and hours for meals, was required, penalty of not over \$10 being enacted for violation. The hours of children under 16 were limited to eight hours per day, between 7 A. M. and 7 P. M., for six days per week. Moreover, the law stated that the

presence of a child in an establishment during working hours shall be prima facie evidence of its employment therein. Women were permitted to work on Saturdays and on Christmas Eve and the five days next preceding Christmas Eve as much as 12 hours per day in retail stores outside of Baltimore, provided that on each such day at least two rest intervals of not less than one hour each be given, and provided that during the remainder of the year the working day shall not exceed nine hours. In Massachusetts the State Board of Labor and Industries was given power to determine what employments are seasonal and hence properly favored with the exemptions in favor of such employments. In Mississippi slight modifications were made in the 10-hour law for women and in the law relating to night workers, but all such modifications were subject to the 60-hour week limitation.

Numerous modifications of the 10-hour day and 60-hour week law for cotton and woolen mills were made in South Carolina. It was made a criminal offense for an employer to require or permit any one to work longer hours; the 60-hours a year excess time which the law permits in order to make up for losses from accidents must be within the same calendar year in which such loss of time occurred; and such loss of time must be made up within three months; a complete record of all lost time by days, hours, and minutes must be kept. Inter-urban railroads are prohibited from requiring employees to work more than 10 hours a day, except in case of accidents and unavoidable delay. In Massachusetts the State Board is required to investigate hours and conditions of labor in hotels and restaurants, and to report by Jan. 19, 1917. In Virginia the Sunday rest law was declared to permit the delivery on Sunday of ice cream provided same be made on another day.

**LABOR LEGISLATION, AMERICAN ASSOCIATION FOR.** This is a branch of the International Association for Labor Legislation, which has established branches in the important industrial States. It holds conferences on leading problems of industry and has been an important factor in drafting bills and forwarding progressive labor legislation. Its headquarters are at 131 East 23d Street, New York City; its secretary is John B. Andrews. It publishes quarterly the *American Legislation Review*, which during 1916 contained not only a review of labor legislation but reports of conferences on social insurance. During 1916 this organization promulgated standards for health insurance and carried on agitation for the enactment of model bills in Massachusetts and New York (see SOCIAL INSURANCE). At the same time it worked for the advancement of workmen's compensation, the establishment of adequate provisions against unemployment, and the reduction of accidents and occupational diseases, together with insurance against their consequences.

**LABRADOR.** A peninsula in British America, between Hudson Bay and the Atlantic Ocean; also, a strip along the northeast coast of the peninsula which forms a dependency of Newfoundland. Excepting this strip the peninsula is within the Canadian Province of Quebec.

**LABUAN.** A small island off the northwest coast of Borneo, administratively attached to Singapore, Straits Settlements (q.v.).



**LACAZE, ADMIRAL.** See FRANCE.

**LAFAYETTE COLLEGE.** An institution for the education of men at Easton, Pa. It was founded in 1826 and is controlled by the Presbyterian Church. The enrollment for the fall of 1916 was 632. There were 58 instructors. The following new appointments to the faculty were made: Eugene C. Bingham, professor of chemistry; J. Hunt Wilson, assistant professor of chemistry; Francis W. Dickey, professor of economics and government; and Harold McAfee Robinson, professor of biblical literature and college pastor. During the year Lafayette College received by bequest of Albert M. Seip \$250,000, and a gift of \$60,000 to endow the Helen H. P. Manson chair of biblical literature. Also, a conditional grant of \$200,000 was made by the General Education Board. Productive funds amounting to \$630,000 yielded last year an income of \$32,000. The library contains 42,000 volumes. President, John Henry MacCracken.

**LA FOLLETTE, ROBERT MARION.** Re-elected Republican United States Senator from Wisconsin, Nov. 7, 1916.

**LA FONTAINE, PETER, CARDINAL.** See ROMAN CATHOLIC CHURCH.

**LAKE WASHINGTON CANAL.** See CANALS.

**LAMAR, JOSEPH RUCKER.** An American jurist, Associate Justice of the Supreme Court of the United States, died in Washington Jan. 2, 1916. He was born at Ruckersville, Ga., in 1857, and lived in the South most of his life. He was educated at the University of Georgia and at Bethany (W. Va.) College, and in law at Washington and Lee. Admitted to the Georgia bar in 1878, he practiced at Augusta from 1880 to 1903. During this period he served in the State House of Representatives (1886-89) and in 1895 as commissioner to codify the laws of Georgia; of this code he prepared the text. Justice Lamar was appointed, in 1901, an associate justice of the Supreme Court of Georgia, to fill a vacancy, and two years later was regularly elected to this office. Ill health forced him to resign in 1905, when he again took up law practice. His appointment to the United States Supreme Court bench came in 1910 from President Taft, and was something of a surprise, the justice being a Democrat. In 1914, by appointment of President Wilson, he served as one of the two representatives of the United States at the conference at Niagara Falls, in which the representatives of Argentina, Brazil, and Chile endeavored to mediate the differences of this country and Mexico.

**LAMBROS, SPYRIDON P.** A Greek historian and political leader, chosen, according to announcement of Oct. 8, 1916, to head a new cabinet succeeding Premier Nikolas Kalogeropoulos (q.v.). He is the author of numerous historical works and a member of learned societies, and at the time of his appointment held a chair of history in the University of Athens. See GREECE, *History*.

**LAMPS, ELECTRIC.** See ELECTRIC LIGHTING.  
**LAND RECLAMATION.** See DRAINAGE; IRRIGATION.

**LANDS, PUBLIC.** Approximately 150,000,000 acres of Oregon and California land were thrown open to entry and settlement in the fall of 1916. These lands, which were granted originally to the Oregon and California Railroad Company, have been in litigation many years on

account of the refusal of the company to carry out the terms of the grant. The government sued to enforce the terms, and won the case in the United Supreme Court. Congress passed an enabling act to restore the lands to entry, but the Southern Pacific Railroad, which succeeded to the interest of the Oregon and California Company, served notice that it would refuse to abide by the act, and that it intended to fight the case anew through the courts.

The announcement was made by Secretary Lane in August, that over 250,000,000 acres of land remained in the public domain. This land is in 25 different States, extending from California to Michigan, and from Florida to Washington. All but 2290 acres are in the Far West, with the highest acreage in Nevada, 55,375,077. Twelve of the extreme Southern States alone held more than 250,000,000 acres. The exact amount uninhabited and unreserved is 250,945,589. Of this amount about 92,000,000 acres are unsurveyed. The less amount of vacant land is 952 acres, which is in Missouri. There are in Alabama 42,680 acres, in Florida 135,237, in Mississippi 30,374, in Louisiana 44,804, in Michigan, 90,540, in Wisconsin 5782. In the Pacific States there are in California 20,025,990 acres of vacant land, in Oregon 15,337,809, and in Washington 1,132,571. In the Southwestern States, Arizona 23,597,219 acres, Nevada 55,375,077, New Mexico 26,338,379, and Utah 32,968,837. In South Dakota there remain 2,382,588 acres and in North Dakota 381,199. Of the Northwestern States there are in Idaho 15,510,561 acres, in Montana 16,659,725, and in Wyoming 28,528,492. The vacant acres in Kansas are 56,080, in Nebraska 146,256, and in Colorado there remain 14,927 acres vacant. A large portion of the vacant land in these States is worthless for any purpose, either because it is extremely mountainous, or is desert land. In the Southern States a large portion is swampy land, which may be reclaimed, but only after drainage work, on a very large scale.

**LANDSCAPE GARDENING.** See HORTICULTURE.

**LAND SLIDES.** See GEOLOGY.

**LANSING, ROBERT.** See UNITED STATES; UNITED STATES AND THE WAR.

**LAOS.** See FRENCH INDO-CHINA.

**LAURENCE, SIR GEORGE.** An English anthropologist, died in London, Feb. 24, 1916. Born in London in 1853, and educated at the City of London School, he became known especially for his interest in folklore—he was a founder of the Folklore Society, had been its president and later its vice-president, and had edited the *Folklore Journal*. In addition, he had been editor of the *Antiquary* and the *Archæological Review*, and had written much on subjects in his field.

**LAW, ANDREW BONAR.** A British statesman, appointed Chancellor of the Exchequer in Lloyd George's cabinet, formed December, 1916, also a member of the War Council and a government leader in the House of Commons. Since 1900, except for short intervals, he has been a member of Parliament. From 1911 to 1915 he was leader of the Unionist Opposition, and in November of the latter year he became Colonial Secretary in the Asquith Coalition cabinet. See GREAT BRITAIN.

**LAW, RUTH.** See AERONAUTICS.

**LAWN TENNIS.** See TENNIS.

**LEAD.** The lead industry in 1916 made gains in output both in mining and smelting. The lead content of ore mined in the United States in 1916 was about 622,000 short tons, compared with 561,039 tons in 1915, an increase of 60,000 tons, or over 10 per cent. The average price of lead in 1916 was so much greater than in 1915 that the increase in value of the mined output of lead was about 50 per cent.

The State showing the largest gain in the output of lead was Missouri, which made an increase of over 25,000 tons. Good gains were also made by California, Idaho, Nevada, Utah, and New Mexico.

The production of refined lead desilverized and soft from domestic and foreign ores in 1916 was 579,600 tons, worth at the average price \$78,826,000, compared with 550,055 tons, worth \$51,705,000 in 1915. The figures for 1916 do not include an estimated output of 21,800 tons of antimonial copper, worth approximately \$4,283,000. Of the total production desilverized lead of domestic origin inclusive of silver soft lead is estimated at 324,000 tons, compared with 301,564 tons in 1915. Desilverized lead of foreign origin is estimated at 21,400 tons, compared with 43,029 tons in 1915. The production of soft lead chiefly from Mississippi Valley ores is estimated at 234,200 tons, compared with 205,462 tons in 1915, and 201,725 tons in 1914. The total production of desilverized and soft lead from domestic ores was thus about 358,200 tons, valued at \$75,915,000, compared with 507,026 tons, valued at \$47,600,000 in 1915.

In consequence of the great demand for lead a considerable quantity of secondary lead, about 7000 tons, and secondary antimonial lead, over 5000 tons, was recovered at the regular smelters.

**IMPORTS AND EXPORTS.** The import of lead was 20,600 short tons, in ore valued at \$1,575,000; 9200 in base bullion, valued at \$1,091,000; and 6000 tons of refined and old lead valued at \$803,000; a total of 35,800 tons, valued at \$3,468,000, compared with 51,491 tons in 1915. Of the imports of 1916 about 19,500 tons came from Mexico, compared with 47,124 tons in 1915. The exports of lead of foreign origin smelted or refined of the United States showed a great decrease in 1916. There were estimated 9350 tons, valued at \$3,468,000, compared with 38,445 tons in 1915. For the last three years large quantities of domestic copper have been exported to Europe, and the total for 1916 was estimated at 108,200 short tons, valued at \$14,787,000, compared with 87,092 tons, valued at \$7,796,998, in 1915.

**PRICES.** At the beginning of the year the price in New York was 5.5 cents a pound. It rose to eight cents early in April, this being the maximum figure. A decline carried the price

to 5.95 cents a pound in the early part of August. It rose again to seven cents about the middle of September, and remained stationary until early in December, when it advanced to 7.5 cents, and closed at the end of the year at about that figure. See also CHEMISTRY, GENERAL; METALLURGY.

**LEAGUE TO ENFORCE PEACE.** See INTERNATIONAL PEACE AND ARBITRATION.

**LEATHER.** The abnormal conditions due in large part to the war continued in 1916 in the leather industry, and the production and use of this commodity were the subject of much economic and technical discussion. During the year there was an increased slaughter of cattle both in North and South America and with the decrease in the European production of leather, American manufacturers were able in part to respond to the extraordinary demand and to secure extraordinary prices. So inadequate was the supply of leather that an embargo was seriously proposed. The production of leather in both Americas also was stimulated by the great war demand for beef which had involved the slaughter of many cattle without a corresponding increase in their number. And so far as the United States is concerned there was actually a progressive decrease in the number of beef cattle. The increased number slaughtered held not only for the United States but also for South America, and while it served to increase the supply of hides for the year, yet it gave rise to the question as to whether a gradual extermination of the cattle of the world was not actually taking place.

Of course, in such belligerent countries as Germany there had been a net decrease of more than 3,000,000 head of cattle since the beginning of the war, and the same condition held in other countries. Therefore with the vast numbers of cattle killed by neutral nations it was believed that with the end of the war there would be not only a decreased number to be slaughtered with the lessened demand for beef, but an even more general shortage of animals. Thus in the United States the exports of beef in the fiscal years 1915 and 1916 were 277,558,928 and 319,692,447 pounds respectively, or a total of 597,251,375 pounds for the two years ended June 30, 1916. Similar figures for 1913 and 1914, or just prior to the war, were 40,059,355 and 33,625,111 pounds respectively, or a total of 73,684,466, the war period increase representing the great total of 521,566,919 pounds. The beef exports from Canada and South America also showed corresponding gains.

The actual number of cattle slaughtered at the principal markets of the United States in 1915 and 1916 are given in the accompanying table

LIVE STOCK SLAUGHTERED AT PRINCIPAL POINTS, YEARS 1916 AND 1915

	Cattle		Calves		Sheep		Hogs	
	1916	1915	1916	1915	1916	1915	1916	1915
Chicago	2,028,504	1,881,049	495,079	411,879	8,461,619	3,252,010	7,783,497	6,519,125
Kansas City	1,149,052	851,823	151,492	83,202	1,177,385	1,193,862	2,527,271	2,113,780
Omaha	842,901	682,529	.....	.....	1,869,557	1,898,916	2,891,177	2,012,259
St. Joseph	306,487	246,111	24,637	20,972	623,883	614,608	2,106,809	1,523,563
Fort Worth	321,154	267,489	152,639	94,421	189,343	201,317	860,050	891,405
Indianapolis	167,590	141,550	40,545	33,974	81,816	40,070	1,511,221	1,495,711
Oklahoma City	180,246	124,644	46,971	13,128	74,188	46,276	729,040	461,961
Wichita	85,984	67,336	.....	.....	8,504	18,902	468,486	471,164
Sioux City	212,951	222,955	19,844	21,237	216,261	209,595	1,807,031	1,189,202
Totals	5,294,869	4,485,436	981,207	678,818	7,647,056	7,475,556	19,679,382	16,178,170
Increase	809,433	.....	252,394	.....	171,500	.....	3,501,212	.....

Wichita and Omaha count calves as cattle. St. Louis figures not available at end of 1916.

and indicate the sources of American leather, for the fundamental consideration must be observed that leather is but a by-product in the slaughter of animals for food.

But this increased production did not satisfy the demand and where the imports of cattle hides into the United States in the fiscal years 1913 and 1914 had been 7,814,659 and 7,220,417 respectively, in 1915 and 1916 they had grown to 8,839,360 and 12,840,713 respectively, or an increase of 6,644,997 for the two-year war period ended June 30, 1916. Correspondingly the war period exports of leather, shoes, etc., were for 1915 valued at \$120,727,156, and for 1916 at \$146,613,815, as compared with \$63,893,351 in 1913 and \$57,466,261 in 1914, or an increase of \$145,981,350 for the corresponding two war years, or 120.28 per cent, while the increase in the imports of hides amounted to 44.20 per cent. Such conditions naturally influenced hide prices in 1916 and the market for both Chicago packer and country hides made new records, with a maximum average in December of 33.33 for heavy native steers at the packers' and 26.63 for the same line of country hides, with calf skins reaching a figure of 54.17 and kipskins 35.66. The accompanying table indicates the comparative values by years. In leather, hemlock sole leather during the year increased from 32 to 58 cents; oak sole leather from 54 to 88 cents; belting butts from 76 to 89 cents; Union sole leather from 52 to 85 cents; chrome tanned side leather of dull black finish from 28 to 55 cents; colored calf skins from 36 to 85 cents; black calf from 34 to 75 cents; and in similar proportions throughout the list.

army shoes did not last over a month in field service and other leather goods in the same proportion. In both belligerent and neutral countries the governments were forced to act to supervise the leather industry and trade. In Denmark the export of raw horse hides, horse hair, and cow hide was prohibited, while in Switzerland the leather trade and especially the shoe factories were placed under the control of the Department of Agriculture and the War Office, with power to fix maximum prices and to issue regulations to tanners. By issuing licenses the government endeavored to enable merchants and manufacturers to buy at fair prices, and the withholding of stocks was prevented. In Germany, owing to the absence of foreign sole leather hides, there was a dearth of sole leather, all existing stocks being held for the army, and various substitutes were employed. Pig skins and deer skins were being worked into sole leather and thin splits were being pasted together with a thin piece of grain leather to form a substitute that was said to be fairly waterproof. For upper leathers Germany was better off, as raw calf skins were being imported from Holland. There was less kid than was needed, while all harness leather was being taken by the military authorities. There was a serious scandal in the government institution which looked after the requisition and the division of hides among manufacturers, one of the officials having been bribed to show favoritism in the selection of hides. In Russia tanning and boot manufacturing industries were being organized and supervised under the direction of an imperial councillor in order to work up the raw

AVERAGE PRICES OF HIDES IN THE UNITED STATES

PACKER HIDES												
Packer Hides, 1916		Heavy Native Steers	Heavy Texas Steers	Light Texas Steers	Butt Branded Steers	Colorado Steers	Branded Cows	Heavy Native Cows	Light Native Cows	Native Bulls	Branded Bulls	Average Prices
Average, 1916	.....	26.23	24.23	24.06	23.86	23.84	23.94	24.89	24.89	21.41	18.47	23.537
" 1915	.....	24.26	21.48	21.12	21.37	20.39	20.90	23.55	22.97	19.24	16.39	21.167
" 1914	.....	19.76	19.23	18.77	18.56	18.20	18.49	18.94	19.27	16.20	15.15	18.257
" 1913	.....	18.88	18.06	17.72	17.42	17.26	17.19	17.28	17.27	14.82	13.80	16.920
" 1912	.....	17.89	16.58	16.14	16.17	15.88	15.71	16.40	16.30	14.07	12.03	15.697
" 1911	.....	14.81	14.32	13.54	13.50	13.47	12.56	13.87	13.50	12.11	10.50	13.218
" 1910	.....	15.29	14.88	13.77	13.71	13.42	12.40	13.79	13.04	11.96	11.10	11.931

COUNTRY HIDES												
Country Hides, 1916		Heavy Steers	Heavy Cows	Buffs	No. 3 Bufs	Extremes	Country Packer Branded Hides	Country Branded Hides	Bulls	Calfskins	Kipskins	Average Prices
Average, 1916	.....	20.75	20.17	20.37	19.35	22.68	21.86	17.94	17.28	34.55	24.84	21.969
" 1915	.....	19.87	19.06	18.98	17.92	19.65	18.62	16.13	15.90	21.60	19.60	18.713
" 1914	.....	16.56	16.42	16.63	15.64	17.70	16.34	14.53	18.98	21.90	19.26	16.896
" 1913	.....	15.39	15.00	15.05	14.31	15.60	14.43	13.54	12.73	17.18	16.74	14.997
" 1912	.....	14.25	14.06	14.05	13.02	14.91	13.12	12.33	11.22	18.60	16.01	14.157
" 1911	.....	12.24	11.82	11.82	10.79	12.80	10.73	10.02	10.01	16.34	13.23	11.979
" 1910	.....	12.16	11.26	11.13	10.02	11.51	10.20	9.49	9.86	16.02	12.08	11.378

The leather situation in Europe involved not only the demand for boots and shoes, harness, and other equipment for vast armies, but a constant destruction of this material and a lack of sources for its replacement. As an indication of this vast destruction it was said that

material of the Empire. An embargo was placed upon exports but in 1916 750,000 calf skins were shipped to the United States in exchange, it was said, for sole leather. American imports, especially leather, were securing a good foothold in Russia. In Great Britain at the end of the year

it was announced that the Army Council intended to requisition all leather in a series of specified schedules which included vegetable tanned bends, butts, and backs of certain requirements, chrome tanned bends, butts, and backs of specified substance, kip and vegetable, and other upper leathers. See **BOOTS AND SHOES**.

**LEAVITT, ERASMUS DARWIN.** An American mechanical engineer, died at Cambridge, Mass., March 11, 1916. He was born at Lowell, Mass., in 1836, and was connected with various engine works in New England until 1861, when he became an assistant engineer in the United States navy. He served throughout the Civil War and until 1867, when he returned to private practice. Perhaps his most important work was done as consulting engineer of the Calumet and Hecla Mining Company from 1874 till his retirement 30 years later; he designed the machinery in use at the Hecla Mine. In addition, Mr. Leavitt was consulting engineer to the cities of Boston and New York. Equipment designed by him was installed by the Bethlehem Steel Company and by South African mining concerns. Besides holding membership or honorary membership in many scientific societies, he was president of the American Society of Mechanical Engineers in 1883.

**LEE, SIR SIDNEY.** See **LITERATURE, ENGLISH AND AMERICAN, Works of Reference, etc.**

**LEeward ISLANDS.** The Leeward Islands (so called in contrast to the Windward Islands, which are most exposed to the N. E. Trade, the prevailing wind in the West Indies) form the most northerly group of the Lesser Antilles, the whole of which are included among the Windward Islands as the term was used by the Spaniards. Some of them belong to Denmark (part of Virgin Islands), Holland (St. Eustatius, Saba, a part of St. Martin), France (Guadeloupe, Martinique, St. Bartholomew, and part of St. Martin), and the United States (Vieques and Culebra). The English Leeward Islands, composed of the presidencies of Antigua (with its dependencies, Barbuda and Redonda), Montserrat, St. Kitts and Nevis (including Anguilla), Dominica, and the Virgin Islands, were constituted a single federal colony by an act passed in the Imperial Parliament in the session of 1871. The total area of the colony is 704 square miles, and its population about 131,964. The island of Sombrero was added to the colony by order in council under the Colonial Boundaries Act, on Aug. 10, 1904.

The table below gives area in square miles, population (1911), imports and exports for 1914, revenue and expenditure for 1914-15, of Antigua (A), Montserrat (B), St. Kitts and Nevis (C), Dominica (D), and the Virgin Islands (E):

	Sq. m.	Pop.	Imps.	Exps.	Rev.	Exp.
A	171	82,265	159,898	183,515	53,517	54,849
B	33	12,196	37,908	37,336	11,674	18,408
C	150	43,808	201,277	173,754	50,337	62,109
D	304	53,863	205,773	213,375	48,896	53,486
E	58	5,562	9,081	6,905	4,903	5,554

**LEGISLATION IN 1916.** This article is intended to cover the most important legislative measures passed by the State legislatures in 1916. Federal legislation is covered in the section *Congress*, article **UNITED STATES**, and in other articles dealing especially with the sub-

jects to which the measures relate, as **BANKS AND BANKING, RAILWAYS, TAXATION, TRUSTS, etc.** See also **LABOR LEGISLATION**.

Regular sessions were held during the year in Georgia, Kentucky, Louisiana, Maryland, Massachusetts, Mississippi, New Jersey, New York, Rhode Island, South Carolina, and Virginia. Special sessions to consider emergency consideration were held in California, Illinois, Oklahoma, South Dakota, and Tennessee. In the regular sessions in the several States there were introduced over 15,000 bills; the majority of these, however, failed to become a law. The most important measures from a national standpoint are noted in the following subdivisions.

**ADMINISTRATION OF JUSTICE.** The Mississippi Legislature inserted in the State constitution amendments adopted by the people in November, 1914, increasing the number of Supreme Court judges to six, requiring them to be elected by the people, and fixing their term at eight years. In Massachusetts the criminal and civil jurisdiction of district courts or municipal courts was so extended that their process runs throughout the State, and makes them courts of superior and general jurisdiction. In Virginia court clerks are authorized to appoint as deputies women over 21. In Georgia also the civil code was amended to make women eligible as clerks. A juvenile court was created in Maryland in any county where all the judges of the circuit deem it necessary. In Mississippi a constitutional amendment adopted in 1914 was inserted in the constitution permitting the Legislature to provide that in all civil cases in circuit or chancery courts nine or more jurors may return a verdict. In Maryland it was provided that a jury may add to a first degree murder verdict the words "without capital punishment," in which case the courts shall impose a life sentence and not a death penalty. Practically the same legislation was passed by the Legislature of New Jersey. In Mississippi public hangings are prohibited. In Massachusetts the board of prison commissioners was abolished and a bureau of prisons created instead.

**ORGANIZATION AND ADMINISTRATION OF STATE GOVERNMENTS.** The budget system was established in New Jersey. This requires the Governor to make his recommended appropriations on the basis of estimates submitted by the departments. All appropriations are required to appear in the general appropriations bill. The New York Legislature also provided the budget system, which required the Governor to submit recommended appropriations and authorizes him to submit estimates of revenue. The Maryland Legislature proposed a constitutional amendment which would put the finances of the State on a budget system. (See **MARYLAND**.) In Louisiana a board of State affairs was created. In New Jersey there was created a central purchasing agency controlled by the commission consisting of the Governor, treasurer, and comptroller, to purchase all supplies for State departments and offices, except for construction work. In Massachusetts the economy and efficiency commission was abolished and a supervisor of administration created instead. The Virginia Legislature created an economy and efficiency commission to investigate the possibility of a more efficient and economical organization and administration of the State and local governments. The Virginia Legislature proposed a constitu-

tional amendment authorizing the Legislature to submit to cities the choice of several forms of governments. City planning was provided for in Massachusetts.

**EDUCATION.** In New Jersey the conferring of degrees by any institution not licensed by the State Board of Education was prohibited. In New York there was incorporated an Institute for Public Service to conduct a training school to place men for the public service by doing field work in cooperation with public officials. In Mississippi there was created a uniform commission to study and eliminate adult illiteracy. A training school for delinquent children was also established. The Kentucky Legislature provided for a census paid illiteracy commission for adult illiteracy. In New Jersey appropriations were made for vocational education. In Massachusetts cities whose voters accept the act by referendum may establish day or night schools in agriculture or horticulture under the supervision of the board of education. In Maryland for the first time compulsory education was made State wide. Children between 7 and 13 must attend during the entire year. In Louisiana a compulsory school attendance law applying to children between 7 and 14 years of age was enacted. In Georgia the Legislature enacted a compulsory school attendance law requiring children between 8 and 14 to attend school, but making many exceptions. In Maryland the entire school system was reorganized. The act was drawn by a commission in cooperation with the Rockefeller Foundation. In Louisiana a State board of education was created.

Other legislation will be found noted under the articles **ELECTORAL REFORM; FOOD AND NUTRITION; LIQUOR REGULATION; MILITIA; TAXATION;** etc.

**LEHIGH UNIVERSITY.** A nonsectarian institution for the education of men at South Bethlehem, Pa., founded in 1866. In the fall of 1916 there was a total student enrollment of 775 and the faculty numbered 81. During the year there were no important changes in the faculty and no noteworthy benefactions. The productive funds of the institution amounted in 1916 to \$1,181,871. The library contains 140,884 volumes. President, Henry Sturgis Drinker.

**LELAND STANFORD JUNIOR UNIVERSITY.** A non-sectarian co-educational institution at Palo Alto, Cal., the post office address of which is Stanford University, Cal. It was founded in 1891 by Leland Stanford and his wife in memory of their son. The total number of students enrolled in all departments in the fall of 1916 was 2010. The faculty numbered 199. In January Dr. Ray Lyman Wilbur was transferred from the deanship of the Medical School to the presidency of the university, succeeding Dr. John Casper Branner, who retired as president emeritus. Dr. Albion W. Hewlett, of the University of Michigan, was appointed to Dr. Wilbur's former office, and Prof. Charles A. Huston was promoted to be dean of the Law School, in succession to Dr. Frederick C. Woodward, resigned. Chester G. Vernier, of the University of Illinois, became professor of law. To take the place of Dr. Oliver P. Jenkins, who retired, Ernest G. Martin of Harvard University was appointed to the chair of physiology. During the year also, Dr. David Starr Jordan retired as chancellor emeritus and Dr. Lillian J. Martin as emeritus professor of psychology.

Dr. Alvin S. Johnson, formerly professor at Cornell and an editor of the *New Republic* (New York), was appointed professor of political science. The principal benefaction of 1916 was a gift of \$80,000 made by Thomas Welton Stanford, trustee of the university, for the erection of an art gallery, nearly completed at the end of the year. Ground was broken for a new library building to cost about \$500,000, and work was begun on a \$500,000 hospital building to be connected with the medical school of the university, in San Francisco. During the year, military drill was established and made compulsory on students for two years of their course. Maj. Jens Bugge, U. S. A., retired, was appointed professor of military science and tactics. It was decided to maintain the university in continuous session throughout the year, which will be divided into four quarters. In productive funds, Leland Stanford has \$24,534,941, and in 1916 it had an income of \$1,031,069. On July 31, 1916, there were 276,251 volumes in the library.

**LEONARD, ADNA W.** See **METHODIST EPISCOPAL CHURCH.**

**LEPROSY.** Argentina is the latest country to come under notice as harboring considerable numbers of lepers, who are practically uncontrolled. Penna, chief of the National Public Health Service and professor at the University of Buenos Aires, says that there are no ordinances preventing lepers from traveling about and no institution in which to segregate them.

The House of Representatives on May 5th, passed house bill No. 103, an act to provide for the care and treatment of persons affected with leprosy, and to prevent the spread of leprosy in the United States, in which it asks the concurrence of the Senate. Illinois opened on May 22, 1916, a leprosarium on the grounds of the Watertown Hospital.

The diagnosis of leprosy has been shown by Neve to be made more certain, particularly in doubtful cases, by the X-ray. Examination by this agent demonstrated well the bony lesions, namely, a clubbing of the fingers, of which the terminal joint lacked symmetry. In the toes of Neve's case there was almost entire disappearance of the terminal phalanges of several of the toes.

Takane used a preparation of copper and potassium cyanide, called cyanocuprel, in six cases of leprosy, with what appeared to be beneficial results. See **TUBERCULOSIS.**

**LEBOY-BEAULIEU, (PIERRE) PAUL.** A French economist, died at Paris, Dec. 10, 1916. He was born at Saumur in 1843, was educated at Paris and at Bonn and Berlin universities, and afterward contributed to French publications. He was a firm believer in free trade. His first important book, *L'Influence de l'état moral et intellectuel des populations ouvrières sur le taux des salaires*, was published in 1867. He was appointed professor of finance at the Ecole Libre des Sciences Politiques in 1872, and professor of political economy at the Collège de France in 1880. In 1873 he founded the *Economiste Français*. He was made a member of the Legion of Honor and of the Academy of Political and Social Science, and received honorary degrees from several foreign universities. His works include: *La colonisation chez les peuples modernes* (1873); *Précis d'économie politique* (1888); *L'Etat moderne et ses fonctions* (1889);

*Traité théorique et pratique d'économie politique* (1895); *La Sahara, le Sudan et les chemins-de-fer transsahariens* (1904); *L'Art de placer et gérer sa fortune* (1906); *La question de population* (1913); *Première année de guerre: l'août, 1914—31 juillet, 1915* (1915).

**LEUKEMIA.** This form of anemia, characterized by an immense multiplication of the white blood corpuscles, is believed by Dias to be the work of a fungus, which he names *Adenomyces leukamiae*. Dias injected the blood and lymph of three patients into laboratory animals and all of them died, showing pathological lesions similar to those of human leukemia.

**LEVITZKI, MISCHA.** See **MUSIC, Artists, Instrumentalists.**

**LEVY-LAWSON, EDWARD.** See **BURNHAM, E. LEVY-LAWSON, first BARON.**

**LIBERIA.** An independent negro republic on the west coast of Africa, founded in 1822 by America philanthropists for the settlement of freed slaves. The area is variously estimated at from 35,000 to 41,000 square miles and has a population of between one and two millions, including about 10,000 Americo-Liberians. The indigenous negroes, with the exception of the Mandingo tribe (Mohammedan), are mainly pagans, and there are said to be cannibals in the interior. The development of the country is hindered by lack of roads, impassable forests, and by laws preventing the acquisition of land by any but Liberians or (until 1909) trading by foreigners in any part of the country excepting at official ports of entry. A concession obtained by Lever Bros., Ltd., embracing 12,000 square miles and intended to open up the country, was rejected by the Senate. The mineral wealth is unexploited except for the operation of a native company. The products for export are palm oil, coffee, rubber, and ivory. Cotton is indigenous but little cultivated. Imports, 1913, \$1,150,491; exports, \$1,112,187—palm oil and kernels, piassava fibre, coffee, rubber, and ivory.

Seventy per cent of the trade is with Germany. In 1914 vessels entered to the number of 371, of 845,901 tons. Monrovia (6000 inhabitants) is (since 1910) a cable station on the route from Germany to Brazil. The Government of French West Africa obtained permission to establish a wireless station there. The budget for 1913-14 balanced at \$531,500. Restriction of revenue due to the European war prevented the preparation of a 1914-15 budget. The debt stood, Dec. 31, 1914, at \$1,510,000; of which internal floating debt, \$200,000. A president (1912-16, Daniel Edward Howard) elected for four years is the executive.

**LIBERTY, STATUE OF.** See **ELECTRIC LIGHTING.**

**LIBRARY ASSOCIATION, AMERICAN.** The 38th annual meeting of the Association was held at Asbury Park, N. J., June 26th-July 1st. There were present 1386 members out of a total of more than 3100. Miss Mary W. Plummer (q.v.) was to have presided but an illness, which terminated fatally, prevented her from being present. Her paper on "The Public Library and the Pursuit of Truth" was read, and the titles of other papers were: "How the Community Educates Itself," by Arthur E. Bostwick; "Children's Books," by John Jay Chapman; "Democracy in Modern Fiction," by Mary Ogden White; "The New Poetry and Democracy," by

Jessie B. Rittenhouse; "Modern Drama as an Expression of Democracy," by Robert Gilbert Welsh; "Some of the People We Work For" (the foreigners of our large cities), by John Foster Carr; "Leadership Through Learning," by William Warner Bishop; "The Public Library as Affected by Municipal Retrenchment," by Frederick C. Hicks; "Possible Book Results of the European War," by Walter Lichtenstein; "Library Preparedness in the Fields of Economics and Sociology," by Adelaide R. Hasse; "Library Work with Children," by Henry E. Legler; "The Place of the School Library in Modern Education," by James Fleming Hosc; "Americanizing Books and Periodicals for Immigrants," by J. Maud Campbell; and "An Americanization Program for Libraries," by H. H. Wheaton.

The officers elected at the annual meeting were as follows: President, Walter L. Brown, Public Library, Buffalo, N. Y.; first vice-president, Harrison W. Craver, Carnegie Library, Pittsburgh, Pa.; second vice-president, George H. Locke, Public Library, Toronto, Canada. The executive board consists of these officers and in addition six other members. The secretary is George B. Utley, 78 East Washington Street, Chicago, and the treasurer, Carl B. Roden, Public Library, Chicago. Special committees, appointed or re-appointed for 1916-17, are studying among other things: Library extension in Europe after the war; expansions of the Decimal Classification; certification of librarians and standardization of libraries; investigation of insurance rates for books and library buildings and equipment; library publicity methods; library work in hospitals and charitable and correctional institutions; code of practice for inter-library loans; book-binding for libraries; library training; library administration; etc.

The American Library Association conferences are divided into a system of sections as follows: College and Reference; Trustees; Catalogue; Library Work with Children; Professional Training; Agricultural Libraries Section; School Libraries Section.

Four national organizations are affiliated with the American Library Association: National Association of State Libraries; League of Library Commissions; American Association of Law Libraries; and Special Libraries Association.

The Publishing Board of the Association publishes the *A. L. A. Booklist* (edited by May Massee) and the official *Bulletin*, and also, in 1916, put out *Brief Guide to the Literature of Shakespeare*, by H. H. B. Meyer; *Lists of Material Which May be Obtained Free or at Small Cost*, by Mary J. Booth; *Subject Headings for Use in Dictionary Catalogs of Juvenile Books*, by Margaret Mann; *Selected List of Russian Books*, compiled by J. Maud Campbell; *Recent French Literature: An Annotated List of Books Recommended for Libraries*, by Sarah Graham Bowerman; *Manual for Libraries in Hospitals, Prisons, Reformatories, and Other Institutions*, by Carrie E. Scott; *Collection of Social Survey Material*, by Florence R. Curtis; *List of Books on Scientific Management*, by C. Bertrand Thompson; and a new edition of the *Handbook of the League of Library Commissions*, edited by Henry N. Sanborn.

**LIBRARY BUILDINGS.** See **ARCHITECTURE; LIBRARY PROGRESS.**

**LIBRARY OF CONGRESS.** The library contained, at the close of the fiscal year 1916, 2,451,974 books, a gain of 88,101 over 1915; 154,200 maps and charts, a gain of 6647; 770,248 volumes and pieces of music, a gain of 42,440; and 392,905 prints, a gain of 7148. There was a considerable decrease in the net accessions as compared with 1915. This was accounted for in part by the practical closing of the sources of supply in continental Europe and in part by unusually large deductions of material through consolidation in binding and through exchanges, transfers, and returns. The eliminations, though considerably above the average of recent years, were greatly exceeded in 1906, 1908, and 1909. While no considerable collection of books was received by gift, the aggregate of gifts from thousands of sources—private, corporate, and official—reached the considerable total of 28,285 volumes. Among these may be mentioned *The Collection of Arms and Armor of Rutherford Stuyvesant, 1845-1909*, by Bashford Dean; a copy of *The Royal Commission on the Losses and Services of American Loyalists, 1785-1785*, from Mrs. Whitelaw Reid; a set of *Japanese Temples and Their Treasures*, consisting of portfolios of plates, with text, from Mr. H. Yamawaki, Commissioner-General of Japan to the Panama-Pacific Exposition; a fine copy of his work entitled *L'armée du duché de Varsovie*, from the artist Jan V. Chelminski; and a number of books in the Hindi language, given on behalf of the Nagri Pracharni Sabha, a literary research society in Benares. Mr. P. Lee Phillips, Chief of the Division of Maps and Charts, gave a valuable supplement to Cushing's *Initials and Pseudonyms*, in five folio manuscript volumes, the result of many years of research by the giver. Dr. Walter T. Swingle, of the Bureau of Plant Industry, added to the East Asiatic collections of the library by the purchase of 271 Chinese works, 176 Japanese works, 3 Korean works, 2 sets of Chinese and 9 sets of Japanese periodicals. The accessions in the manuscript division in 1916 had kept up well with the average of recent years, both in volume and importance. Among them may be mentioned such collections as the papers of Alexander Hamilton, General Sumter, W. L. Marcy, J. C. Bancroft Davis, S. F. B. Morse, and others.

**LIBRARY PROGRESS.** The year 1916 was not marked by any unusual undertakings or great events in the library world. The continuance of the European war prevented the execution of any international bibliographical work, and the difficulty of importing books from central Europe diminished to a marked degree the annual additions to most libraries of the scientific and research type.

**LIBRARY BUILDINGS.** The extreme prosperity of the United States and the resultant cost of materials delayed several important buildings, chiefly the new structures for the Brooklyn Public Library and the John Crerar Library of Chicago. Cleveland's \$2,000,000 bond issue for its Public Library building has at last become available by a court decision, and a competition has been held to select an architect. This library is to form part of the notable group of city buildings on the lake front.

**LIBRARY LEGISLATION.** Only a small number of State legislatures were in session in 1916, and

an unusually small amount of general library legislation was passed. New York "exempted from taxation all real estate owned by a free public library situated 'outside of a city,' the income from which is needed and used for the purposes of the library." A bill, however, exempting from taxation all the property, real and personal, owned by a public library was defeated, as a similar bill had been before.

**LIBRARY LITERATURE.** Among the important publications of the year were the various classification schedules of the Library of Congress. The greater portion of the classification scheme of this library is now in print, with adequate indexes to the several parts. The remaining classes should be out in 1917, when a complete index to the whole classification should be a possibility. The 1916 report of the Librarian of Congress notes libraries which have adopted this scheme of classification despite difficulties due to its incomplete state.

The Virginia State Library issued Mr. Earl G. Swem's *Bibliography of Virginia*, part I, one of the most valuable bibliographies of recent years. This is the first of four volumes. The New York Public Library performed a distinct service in reprinting the report made at the Berkeley Conference of the American Library Association on *Library Facilities for the Blind in the United States*. Perhaps the most valuable technical contribution of the year was Arthur L. Bailey's *Library Bookbinding* (White Plains, N. Y., H. W. Wilson Co.). Mr. Bailey has been for several years the chairman of the Library Association's committee on binding, and has embodied in this book the results of his labors in a trying and difficult field.

The Shakespeare tercentenary produced a crop of bibliographical works on that poet, among which the best was H. B. Meyer's *Brief Guide to the Literature of Shakespeare* (Chicago, A. L. A. Publishing Board). The Bodleian Library of Oxford University and the New York Public Library issued valuable catalogues descriptive of exhibits of Shakespeare material.

Perhaps the most important change in policy occurring during the year was the decision of the British Museum to print a much larger edition of its *Catalogue of Accessions* and to sell the publication for a moderate sum (£3 per year). This opens up to the whole library world a record previously published only in some 40 copies and available only to certain very large libraries.

Of more general interest was the publication of Mr. John C. Dana's collected addresses and essays under the title *Libraries* (White Plains, H. W. Wilson Co.). This volume contains a series of stimulating public addresses, beginning with the author's presidential address before the American Library Association in 1896. The relations of libraries and schools were presented from a local, but fairly typical, point of view in the brochure by Mr. L. P. Ayres and Miss A. McKinnie, *The Public Library and the Public Schools*, published in the Cleveland Education Survey. For the use of high school students, Miss F. M. Hopkins published *Reference Guides* (Detroit, Willard Co.), and Mr. L. O. Wiswell, *How to Use Reference Books* (New York, American Book Co.). Miss Corinne Bacon brought out two lists of books for children, one of 1000 titles, and the other of 2000 (White Plains Wilson Co.).

**NECROLOGY.** Shortly after the completion of her term of office as president of the American Library Association, Miss Mary W. Plummer died. She was easily the foremost woman in library work, having been for many years director of the Pratt Institute Library School, and for five years before her death, principal of the Library School of the New York Public Library. Dr. John Thomson, the veteran head of the Philadelphia Free Library, and Prof. J. C. Schwab, librarian of Yale University, were also among the year's losses by death.

**AMERICAN LIBRARY ASSOCIATION.** The annual conference was held late in June at Asbury Park, N. J., and was the largest in point of attendance in the association's history. The programme emphasized the service of libraries in a democracy. The proceedings have been published by the Publishing Board (Chicago, 78 E. Washington Street). See **LIBRARY ASSOCIATION, AMERICAN.**

**LIBYA.** An Italian possession on the Mediterranean coast of Africa, composed of Tripoli and Cyrenaica, both under a common governor (since July 15, 1916, Lieut.-Gen. Giovanni Ameglio). The area is estimated at 405,800 square miles, and the population at about 1,000,000. The city of Tripoli, with 75,000 inhabitants, is the capital of Tripoli; Bengazi, with 30,000, of Bengazi; both Mediterranean ports.

Railways are building, but the trade is mostly by the great caravan routes. Imports are reported for 1913 at £1,021,340 and exports at £137,101. Colonial revenue for 1915-16 was estimated at 15,100,300 lire; state contribution, 44,221,100; extraordinary, 2,250,000—total, 70,896,000 lire. Civil expenditure, 19,393,200; military, 39,928,206; extraordinary, 11,525,300—total, 70,896,700. The treaty of Ouchy provides for the retention by the caliph of religious authority.

**LIEBKNECHT, KARL.** See **GERMANY, History.**

**LIFE AND ADVENT UNION, THE.** See **ADVENTISTS.**

**LIFE INSURANCE.** See **INSURANCE.**

**LIGHT.** See **PHOTOGRAPHY; PHYSICS.**

**LIGHTHOUSES.** The number of aids to navigation maintained by the United States Lighthouse Service on June 30, 1916, as compared with 1915 is given in the accompanying table:

Class	Total June 30	
	1915	1916
<b>Lighted aids:</b>		
Lights (other than minor lights) . . .	1,661	1,706
Minor lights . . . . .	2,887	2,920
Light-vessel stations . . . . .	58	58
Gas buoys . . . . .	479	512
Float lights . . . . .	124	182
Total . . . . .	5,154	5,825
<b>Unlighted aids:</b>		
Fog signals . . . . .	527	532
Submarine signals . . . . .	50	52
Whistling buoys, unlighted . . . . .	86	88
Bell buoys, unlighted . . . . .	287	288
Other buoys . . . . .	6,488	6,659
Day beacons . . . . .	1,993	2,060
Total . . . . .	9,381	9,624
<b>Grand total . . . . .</b>	<b>14,535</b>	<b>14,947</b>

During the fiscal year ended June 30, 1916, there was a net increase of 412 in the total number of aids to navigation maintained by the Lighthouse Service, including 45 lights above the order of minor lights, 5 fog signals, 2 submarine

bells, 67 daymarks, 33 lighted buoys, 171 unlighted buoys, and 91 minor lights (including 7 float lights). The Commissioner also reported that at 49 stations fixed lights were changed to flashing or occulting lights, and that oil vapor light was installed as an illuminant for 19 lights, acetylene for 44 lights, including two light vessels, and incandescent electric lights were substituted at 13 lights. New fourth-order light stations, each with fog bell, were placed at Rondout North Dike, Hudson River, N. Y., and at Point au Fer Reef, Atchafalaya Entrance, La. In the place of the light-vessel formerly placed at Shovelful Shoal, Nantucket Sound, Mass., a light-vessel was placed at Stone Horse Shoal in the same locality. An important event of the year was the completion of the system of lighted aids in the channel leading to Baltimore, Md.

The work of the Lighthouse Service in Alaska continued, and the total number of aids to navigation on June 30, 1916, was 388, as compared with 338 in 1915. This total included 147 lights, or an increase of 110 lights since June 30, 1910. An important work in Alaska reaching completion in 1916 was the Cape St. Elias lighthouse and fog signal, for which Congress appropriated \$115,000 in 1913. The Cape St. Elias lighthouse is a concrete and hollow tile structure with a double flashing white light and a powerful fog signal. The complete parapet deck, watch room, and helical bar lantern, a massive metal structure, alone some 29 feet in height and weighing about 44,000 pounds, previous to their installation formed a part of the exhibit of the United States Lighthouse Service at the San Francisco Exposition of 1915.

**LIGHTING.** See **ELECTRIC LIGHTING; PHYSICS.**

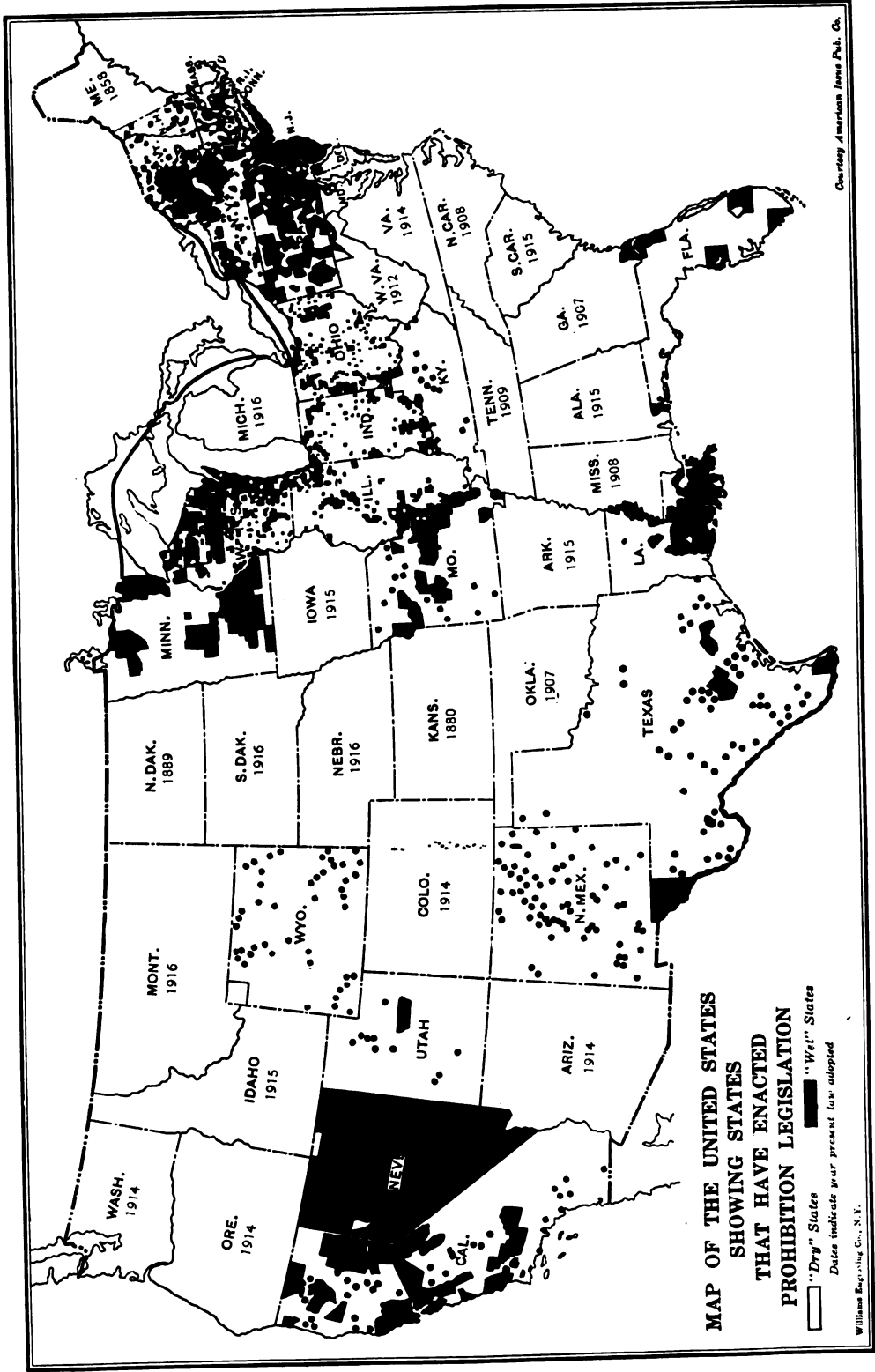
**LINCOLN HIGHWAY.** See **ROADS AND PAVEMENTS.**

**LINDSAY, VACHEL.** See **LITERATURE, ENGLISH AND AMERICAN, Poetry, American.**

**LINTON, SIR JAMES DROMGOLE.** An English painter, died at Haverstock Hill, Oct. 3, 1916. He was born in 1840 in London. His studies at St. Martin's Art School were supplemented by further training under Leigh. Especially in the field of water-color painting he achieved a leading place among the artists of his time. The South Kensington Museum, London, possesses a series of his productions in this medium. He served as president of the Royal Institute of Painters in Water Color from 1884 to 1889 and from 1909 to his death, and as honorary president of the Royal Society of Miniature Painters; and he was honorary or corresponding member of other art societies. Linton was knighted in 1885 and received the Jubilee Medal in 1897. Besides his water-colors, he was known for genre, historical, and decorative paintings in oil.

**LIQUOR REGULATION.** On Jan. 1, 1916, in seven States the prohibition of the sale of intoxicating liquor either by statute or by laws enforcing constitutional amendments went into force. These States were Iowa, Colorado, Oregon, Washington, Idaho, Arkansas, and South Carolina. Local option laws were already in force, but this was now succeeded by State-wide prohibition. In these seven States more than 3000 saloons, breweries, wholesale liquor houses, and distilleries went out of business. This addition brought the total number of States under prohibition to 18. The law which went into force in Idaho was especially drastic. It





Courtesy American Issue Pub. Co.

PROHIBITION IN THE UNITED STATES

William Engeling Co., N. Y.



makes the possession of spirituous or malt liquors a crime, exception being made in the case of wine for sacramental purposes, and pure alcohol for use in medicine or scientific work. A court order, however, is necessary for obtaining wine or alcohol for these purposes.

The inauguration of a new law ended the dispensary system in South Carolina. This system was in force in 15 of the 44 counties of the State. In this State individuals are permitted to obtain by shipment one gallon of spirituous liquor each month. The Washington law permits residents to buy from dealers outside of the State two quarts of spirituous liquor or 12 quarts of beer every 20 days. In Oregon drug stores are not permitted to sell liquor with or without a doctor's prescription, but in any period of four weeks a family may import two quarts of spirituous liquors or 24 quarts of malt liquor for personal use.

Nearly all the legislatures in session in 1916 enacted measures affecting liquor regulation. In some cases the existing enactments were strengthened, and in others provision was made for submitting the question to the people in the November election. The Legislature of Georgia added amendments to the law, which had already been amended in 1915, providing for a more rigorous enforcement of the prohibition laws. The amendments of 1916 regulated the shipment and receipt of limited quantities of liquor. They also authorized the importation of alcohol for use in manufacturing articles of commerce, and provided regulations in reference to such importations. The Virginia Legislature enacted a comprehensive prohibition law forbidding the manufacture, sale, advertisement, etc., of liquors, creating the office of commissioner of prohibition for its enforcement, and in various ways including a simple form of indictment, liability for damages done by intoxicated persons, etc., to discourage the violation of its provision, providing also for local option on the question of permitting intra-State or interstate shipments. The Mississippi Legislature made liquor advertisements criminal, and also authorized injunctions to restrain them. It also forbade the transportation into the State or reception therein of liquors contrary to law. The penalties and provisions for the enforcement of these laws are very rigorous. The Kentucky Legislature regulated licensed liquor dealers, and forbade screen or other obstruction interfering with the full view from the street of rooms where liquor is sold. In Louisiana the Legislature prohibited the keeping or selling of malt liquor whether or not intoxicating or containing alcohol in municipalities where the sale of intoxicating liquor is prohibited. It also made it unlawful to ship or carry any vinous liquors into any portion of the State where the sale of such liquors is prohibited by law or ordinance except as provided in this act. In South Carolina it was made a misdemeanor to sell any formula or distilling apparatus for making intoxicating beverages except those containing less than 2 per cent alcohol or preparation for medicinal purposes.

As a result of the election on November 7th, four additional States voted for prohibition, Michigan, Montana, South Dakota, and Nebraska, making in all 23 States under prohibition laws at the end of 1916. In addition to this the Legislature of Utah will doubtless for-

mulate a prohibition law early in 1917, as the Governor and Legislature practically pledged to this enactment were elected. The same condition applies to Florida, where the Governor and Legislature pledged to prohibition were elected in November. The votes of Colorado, Oregon, and Washington defeated beer amendments of November 7th, and in Arkansas and Arizona proposals for licensing were defeated. At the end of 1916 there were but six States west of the Mississippi where liquor could be sold. These were Missouri, Texas, New Mexico, Wyoming, Nevada, and California. Missouri and California were saved from voting prohibition on November 7th only by the votes of their largest cities, St. Louis and San Francisco. Indications point to Texas, Ohio, Indiana, and Minnesota as likely to vote for prohibition within a year.

Even in the States which are nominally under license or local option, there are large sections where liquor cannot be sold. California is largely dry, and Indiana, Kentucky, Louisiana, Minnesota, Missouri, New Hampshire, Texas, and Vermont are from 50 to 90 per cent dry.

The movement for prohibition by constitutional amendment continued to be agitated in 1916, and although no definite action was taken by Congress, it was generally conceded that such an amendment would again pass the Lower House, and had strong possibility of passing the Senate. One of the most important instances of the year as relating to the enforcement of prohibition was the action of the Supreme Court in declaring constitutional the Webb-Kenyon law, which prohibits the transportation of liquor into prohibition States through interstate commerce.

**LIQUORS.** The course of events during the year 1916 did not tend to raise the gloom which had been gradually overcasting the liquor industry and situation in either the United States or the world at large. In the United States five more States were voted "dry," Michigan, Montana, Nebraska, South Dakota, and Utah—making the total number of prohibition States 24, with an approximate population of 32,500,000. California and Missouri voted "wet," as did the city of Boston after a particularly vigorous fight. As the year closed a constitutional amendment was introduced in Congress for national prohibition, and Senator Sheppard's bill for prohibition in the District of Columbia without a referendum had strong support. The prohibition forces felt that they were coming into their own; the "antis" while downhearted, seemed not to be discouraged, feeling that history would only repeat itself; calling attention to the period from 1857-60 when about the same proportion of the country went "dry," but the pendulum swung back. The Commissioner of Internal Revenue in his report for 1916 stated that there had been no abatement in the illegal sale of liquors by "bootleggers" in the various States and localities where prohibition laws exist. In view of the progress of prohibition the leaders in Congress were making plans to provide revenue to take the place of the one hundred and thirty odd millions of dollars annually collected from the tax on distilled spirits.

Congress repealed the War Emergency Act on wines, etc., and passed an act defining wine and legalizing the fermentation of a solution of sugar added to the must to correct natural deficiencies, to the extent of 35 per cent of the must used, and allowing the addition of sugar

to a dry wine, and the fortification of this product. The new law placed a graded stamp tax on vermouth and imitation wines in proportion to the percentage of alcohol contained up to 24 per cent, beyond which the product was classed as distilled spirits.

It was difficult to ascertain the exact situations abroad. The French Chamber of Deputies seriously was considering the abolishment of the alcohol industry. Russia had so far modified its recent and severe decrees as to allow the making of a small quantity of liquor. The revenues from the manufacture and sale of vodka (the national beverage) dropped from \$500,000,000 to about 4 per cent of that sum. Where drunkenness was the rule it is now the exception. In Great Britain, the restriction in the hours of sale seems to have made but little difference in the quantity sold.

**WINES.** The vintage in France in 1916 was expected to be about three times larger than in 1915, and the quality fair. As would be expected, conditions in this war-stricken wine country were far from satisfactory. The wines could not be given the proper attention on account of the scarcity of labor, and after the harvest the uncertainty of shipping facilities, by reason of the governmental use of the railroads, resulted in the spoiling of many tons of grapes and hogsheads of wine. Prices were firm, because the reserves are almost negligible. In Italy the estimated production of wine was 1,030,264,800 U. S. gallons, about twice as large as in 1915 but less than the average. As the reserve stocks had been depleted there was a very active demand for the 1916 vintage. In Spain and Portugal the situation had prospered considerably during the last year, due to the fact that France was expending her activities in another direction. As both countries produce far more than they consume, prosperity depends largely on the export demand. Spain exported to France five times as much red wine, and to France and England about twice as much sherry as in 1915. In Portugal the value of the exports of white and red wines almost trebled during the year. In some instances brandy sold for prices five times as high as in 1914. Crop reports from Spain indicated an excellent yield of good quality. The indications for Portugal were for a vintage larger than 1915, probably the largest on record.

**American Wines.** In California the sweet wine vintage was thought probably to be above the average of recent years, and the dry wine

**FERMENTED LIQUORS.** The following table shows the production and per capita consumption of fermented liquors in the United States for the years 1915 and 1916:

Year	Bbls. Beer	Per capita Gallons	No. of Breweries	Retail Dealers
1915	59,808,210	18.24	1,845	18,740
1916	58,688,624	....	1,818	12,716

The production decreased about 2 per cent—a very small reduction in consideration of the increased number of States which are supposedly “dry.” Many of the breweries which were forced out of business were producing the so-called near-beer, a product which when it contains less than 0.5 per cent alcohol is not called a fermented liquor by the Bureau of Internal Revenue. An enormous amount of this product was being sold, the supervision of which entailed considerable expense and annoyance to the Bureau of Internal Revenue, as it was a frequent occurrence for real beer to be sold by the retail in bottles bearing the near-beer label.

Figures were lacking as regards the beer production in Germany, but it would hardly fail to be less than in 1915, on account of the scarcity of grain and the requisitions for the army. It was reported at the end of the year that “beer cards” soon would be issued, limiting the amount to be consumed by each holder. In many places the size of the glass had been reduced, while the price had trebled. In Munich beer was only served for two hours mid-day and three hours during the evening.

The Society Islands had established their first brewery, and Egypt was producing all the beer the population could consume—in 1916 about 3,430,000 gallons.

**DISTILLED SPIRITS.** The following are the amounts in proof gallons produced and consumed in the United States during 1915 and 1916:

Year	Produced proof gallons	Tax paid for consumption	Per capita consumption
1915	140,656,108	124,155,178	1.25
1916	253,288,278	186,226,568	...

The spirits bottled in bond were as follows:

1915	9,748,978 proof gallons
1916	12,578,452 proof gallons

The comparative statistics of denatured alcohol for 1915 and 1916 are given herewith:

Fiscal year	Number of denaturing warehouses	Completely denatured	Specially denatured	Wine gallons	Total Proof gallons
1915	23	5,386,646.96	8,599,821.81	13,986,468.77	25,411,718.8
1916	33	7,871,952.82	38,807,153.56	46,679,106.88	84,532,253.1

less than the average. When the vintage is over, however, these forecasts may not prove true, as the new wine law gives the vintner the privilege of making a sweet wine out of a dry wine by adding sugar—and, if the grapes are naturally deficient, about 25 per cent of water may be added to the must. The vintage in New York and New Jersey was probably about normal. In Ohio and Missouri advantage was taken of the new law and about 35 per cent more “wine” might be expected than the normal production.

The number of retail dealers in the United States were as follows: 1915, 190,469; 1916, 184,718.

It is evident that prohibition is not decreasing the output of the distilleries, as 1916 was a banner year, about 12,000,000 more gallons being taxpaid than in the year preceding. The market was firm throughout the year, spirits selling for a higher price than for many years, due to heavy demands for alcohol, not only from Europe and South America, but for use in the manufacture of explosives in the United States.

None of this industrial alcohol paid any revenue to the government, that used in the United States being denatured and that exported being tax free.

Several whiskey distilleries were either entirely converted into spirit houses or ran part of the time on the production of alcohol for "war orders." The figures given for denatured alcohol are abnormal, as over 50 per cent of the total was used in the manufacture of explosives.

**LISTER, ERNEST.** Relected Democratic Governor of Washington Nov. 7, 1916. See WASHINGTON.

**LITERATURE.** See articles on French, German, Italian, Russian, Scandinavian, and Spanish Literatures; also LITERATURE, ENGLISH AND AMERICAN.

**LITERATURE, ENGLISH AND AMERICAN.** Again in 1916 the war cast its shadow over all the fields of English literature, and left its marks, too, upon not a few works of American literature. During the year, the English-speaking world showed a growing interest in serious books, somewhat to the detriment of fiction, serious and other, and especially in historical books bearing upon the present conflict. The increasing demand for books indicated a return towards normal reading habits, even in the face of a still absorbing preoccupation with the news from the front. Once more in 1916 writers of

fall properly within this survey, are duly noted below.

In fiction, most of the best living English and American novelists were active. The average of quality was good, but few works of commanding importance appeared on either side of the sea. War novels abounded, but were on the whole disappointing. The widespread tendency of the novelists to grapple seriously and to practical purpose with social problems was a pronounced characteristic of fiction in 1916. Deeper seriousness and sincerity, and steadier, more sustained, and more successful attempts at the interpretation of American life would seem progressively to mark the development of the novel in the United States. Both English and American letters sustained a great loss in the death of Henry James (q.v.). The poets in the last few years have been heard with increasing enthusiasm, and in the year 1916 there was certainly no abatement in the cordial reception of poetry. Despite the war, the contributions in the fields of the essay, literary criticism, history, biography, and travel were generous in quantity, and often excellent in quality. A great body of scholars and men of letters continue to pursue their labors.

The following comparative statistics, which appeared in the *Publisher's Weekly* for Jan. 27, 1917, are of interest as an indication of the preferences of the reading public:

RECORD OF AMERICAN BOOK PRODUCTION FOR 1916 \*

International Classification	For 1916					For 1915						
	New Publications		By Origin			Total	New Publications		By Origin			Total
	New Books	New Editions	American Authors	English and Other Foreign Authors			New Books	New Editions	American Authors	English and Other Foreign Authors		
				American Manufacture	Imported	American Manufacture				Imported		
Philosophy	299	23	250	16	56	322	388	50	254	11	72	888
Religion and Theology	687	68	581	27	147	755	700	100	584	88	228	800
Sociology and Economics	717	50	673	11	88	767	676	50	590	8	128	726
Military and Naval Science	85	9	88	..	11	94	..	..	..	..	..	..
Law	228	46	265	..	9	274	207	48	241	2	12	255
Education	808	21	804	..	20	324	229	8	217	..	20	287
Philology	215	44	158	49	52	259	224	69	131	74	88	293
Science	587	52	539	8	97	639	505	45	422	4	124	550
Applied Science, Engineering	524	71	526	1	68	595	392	71	337	1	125	463
Medicine, Hygiene	397	119	434	1	81	516	308	117	346	3	76	425
Agriculture	867	16	364	..	19	383	272	18	255	..	30	285
Domestic Economy	137	20	146	..	11	157	128	9	124	1	12	187
Business	232	40	252	..	20	272	219	33	224	3	26	252
Fine Arts	224	14	190	3	45	238	212	14	160	1	65	226
Music	104	9	95	2	16	118	64	8	53	1	18	72
Games, Amusements	130	7	117	1	9	127	97	12	86	..	23	109
General Literature, Essays	866	95	309	21	131	461	311	98	239	49	121	409
Poetry and Drama	748	112	633	77	150	860	487	254	427	136	178	741
Fiction	736	196	703	79	150	932	728	191	643	80	196	919
Juvenile Books	529	141	549	24	97	670	524	70	429	18	147	594
History	693	61	516	82	206	754	711	47	433	22	803	758
Geography and Travel	331	23	289	5	60	354	452	31	299	1	183	483
Biography, Genealogy	481	38	352	14	103	469	505	43	385	11	152	548
General Works, Miscellaneous	100	10	102	1	7	110	110	4	102	1	11	114
	9,160	1,285	8,430	367	1,648	10,445	8,349	1,385	6,932	464	2,338	9,784

\* These figures include pamphlets, of which 1941 were recorded in 1916: 1532 in 1915.

distinction in all branches of literature were moved to express, each in his chosen form, their thoughts and feelings about the struggle, and the works of such authors, or such of them as

**FICTION.** *English.* Novelists whose earlier achievements entitle them to special attention have not been idle. Joseph Conrad offered tales of the Eastern seas and exotic isles and

shores, published as *Within the Isles*. H. G. Wells's *Mr. Briling Sees It Through*, if not one of its author's best novels, may still advance a good claim to being second to none of the novels due directly to the war. *The Lion's Share*, telling of the adventures of a naïve young heroine, suddenly become an heiress, was Arnold Bennett's contribution to the fiction of 1916. By virtue of its style and its beguiling narrative interest, and as a curious literary expression of the personality of its author, George Moore's *The Brook Kerith* is one of the most notable novels that falls within the bounds of this review. It is Mr. Moore's account in the form of fiction of the life of Christ, in which the teachings of Christ are expressed in terms of the author's easy-going naturalism—an account true neither to the letter nor the spirit of the Gospels, and by no means void of offense to the orthodox, the reverent, and the scholarly. W. J. Locke, with his commonplace and melodramatic novel *Viviette*, sank far below the level of his best; nor did he reach that level in his *The Wonderful Year*, which tells of a young Englishman's experiences in France, and gives a glimpse of the great war. Mrs. Ward added *Lady Connie* to the list of her achievements in fiction. Out of fragments of a story discovered among the papers of her father, Charles Kingsley, his daughter, "Lucas Malet" (Mrs. Mary H. St. Leger Harrison) composed a novel entitled *The Tutor's Story*, concerned with English country life in the 1830's. In addition "Lucas Malet" published *Damaris*, which presents Anglo-Indian life in the 'sixties of the last century. May Sinclair, in *The Belfry*, told the story of a perfect lady who with difficulty reconciles herself to her "bounder" husband. Eden Phillpots turned from the potteries and slate quarries of his recent novels to the hop-fields: of life there his *The Green Alleys* is a transcript. Maurice Hewlett, in the tortured style that attracts one and repels another, told a tale of married life entitled *Love and Lucy*. Canon Hannay ("George A. Birmingham"), in his latest novel, *Gossamer*, made a great financier his hero, and concerned himself with problems of international finance. Eden Phillpots made the schoolboy his hero in *The Human Boy and the War*, and E. F. Benson chose school life as a setting for his *David Blaze*, a study of boy friendship of rare sincerity and insight. Mr. Benson also wrote a somewhat incongruous blend of village comedy and serious romance entitled *The Oakleyites*. From J. D. Beresford, author of the Jacob Stahl trilogy, came *These Lynnekers*, a novel of which the critics speak handsomely. Archibald Marshall, in *Watermeads*, again dealt with a transition stage of country life.

Abounding in travel-description is Frank Harris's entertaining story of a gentleman chauffeur and a fair heroine, entitled *Love in Youth*. W. Pett Ridge's *The Kennedy People* is an unvarnished realistic tale of every-day English people. Miss F. Tennyson Jesse, a grand-niece of the poet from whom she takes her middle name, would probably have somewhat startled her great-uncle with certain of the stories—tales of terror and tales of an erotic tinge, published as *Beggars on Horseback*—had that poet been fated to peruse them. There is good entertainment to be had from the finely told stories in Barry Pain's *Collected Tales*. In Sylvia Lind's *The Chorus* is met one of those philandering gen-

uses to whom fiction nowadays is so partial. W. E. Norris wrote a quiet, well-bred, leisurely novel of English life entitled *Troubled Tranton*. Dartmoor is again the scene of a new story by John Trevena, *A Drake by George*. In E. V. Lucas's *The Vermilion Bow*, love, war, and a family chronicle are blended. Algernon Blackwood was again in his favorite field of the mystical-supernatural with *Julius Le Vallon*. Horace Annesley Vachell was represented by *The Triumph of Tim*; Viola Meynell by *Narcissus*; Gilbert Cannan by *Three Sons and a Mother*; Warwick Deeping by *Bridge of Desire*, a study of marriage and the sex question; Maxwell Gray by *The World-Mender*; Charles Marriott by *Davenport*; and Coningsby Dawson by *Slaves of Freedom*. That John Masefield the novelist is not on a par with John Masefield the poet was attested by the novel *Multitude and Solitude*, where the scene shifts from London to the African jungle and back again, and by another novel noted below. The late Mrs. Frankau—"Frank Danby" (q.v.)—ended her literary career with *Twilight*, a morbid but impressive story. The tragedy of a man who married "beneath him" was strongly presented by W. L. George in *The Stranger's Wedding*. In Ethel Sidgwick's *The Accolade* there is a good love story and keen psychological analysis, and in her *Hatchways*, a story of English country life, dextrous structure and brilliant writing are distinctive features. Canada came into the year's fiction with Sir Gilbert Parker's *The World for Sale*, and Australia with a prize-winning novel *The Pioneers*, by Katharine S. Prichard. From the Malay Peninsula Sir Hugh Clifford gathered material for the vivid stories in his *The Further Side of Silence*. Edward C. Booth's *Fondie* is a story of a Yorkshire town, and Miles Lewis's *Chapel* a tale of Welsh country life.

John Masefield's *Captain Margaret* is a romance of the Spanish Main in the seventeenth century. A story with scenes on land as well as on the sea, and a notable novel of the year, is William McFee's *Canales of the Sea*. J. C. Snaith, in *The Sailor*, develops a rude, unlettered sailor into a literary master; and Edward C. Noble in *The Bottle-Fillers* endeavors to show what is wrong with the British merchant marine. A group of the year's authors chose themes bound up more or less with feminist problems. A woman shattering conventional standards is at the centre of "J. E. Buckrose's" (Mrs. Falconer Jameson's) *The Roundabout*; an insurgent feminism underlies Madge Mearn's *The Sheltered Sea*; in W. Dane Buck's *An Average Woman*, a factory girl, married to the factory-owner's son, successfully meets the problems involved in a difficult situation; in *The Guiding Thread*, Beatrice Harraden led her fine heroine out of a Doll's House of a sort; in Stella Benson's *I Pose*, something of an extravaganza, the suffragette keeps well to the fore; and in Stacy Aumonier's *Olga Bardell* we meet a heroine of pronounced modernity engaging in repeated matrimonial experiments.

Differing in kind and quality, but of a romantic and adventurous stripe, are Rider Haggard's South African story *The Ivory Child*, E. Phillips Oppenheim's *An Amiable Charlatan* and *The Kingdom of the Blind*, and Lord Dunsany's fantastic *The Book of Wonder*.



**JAMES WHITCOMB RILEY**  
Died July 22, 1916



Photo by A. L. Coburn

**HENRY JAMES**  
Died February 28, 1916



Photo by Paul Thompson, N. Y.

**EMILE VERHAEREN**  
Belgian Poet  
Died November 27, 1916



**H. G. WELLS**  
British Novelist

**FOUR PROMINENT LITERARY FIGURES OF 1916**





Historical fiction was not forgotten in 1916. C. E. Robinson attempted a picture of Athenian life in the stories or sketches entitled *The Days of Alkibiades*; Maurice Hewlett wrote a vaguely historical Norse story, *Frey and His Wife*; Justin Huntly McCarthy aimed to revive the days of Queen Bess with *In the Spacious Times*; Baroness Orczy would transport the readers of her *Leatherstocking* to the period of Alva and the Prince of Orange; Marjorie Bowen offered sombre romantic tales of different lands in her stories of the seventeenth and eighteenth centuries published as *Shadows of Yesterday*; and Agnes and Edgerton Castle turned out a light romance, *Wind's Will*, that has to do more or less with Anglo-French relations in 1816. A number of the year's novels were concerned with the war. Among these are: Hugh Walpole's *The Dark Forest*, which stands high among the stories which the great conflict has produced; Patrick MacGill's *The Great Push* and *The Red Horizon*, where we read of the author's own experiences, cast into fictitious form, at the front with the London Irish Regiment; Mrs. Belloc Lowndes's ingeniously complicated *Good Old Anna*, concerned with the activities of German spies; John Palmer's *The King's Men*, which illustrates the all-pervasive influence of the war on English life; "Captain Charles de Creapigny's" *Where the Path Breaks*, the hero of which is a kind of military Enoch Arden; and the short stories of Guy Fleming's *Half Lights* and Sir Henry Newbolt's *Tales of the Great War*.

*American.* A curious interest attaches to Mark Twain's posthumously published novel, *The Mysterious Stranger*—the setting, Austria in the late sixteenth century—which strikes a pessimistic note, and reveals in our arch-humorist a sense of the futility of mortal things. From William Dean Howells, friend of Mark Twain, and dean of American letters, came *The Leatherstocking God*, based upon characters and incidents known to Mr. Howells's youth, and notable as a study of the psychology of a latter-day prophet, and as a picture of the life of a frontier Ohio settlement. From the same author came *A Daughter of the Storage*, a thoroughly characteristic miscellany, finished and delicate in its art, including verse and prose, sketch, dialogue, and story. In a very different vein is Hamlin Garland's *They of the High Trails*, faithful to the spirit and the letter of Western life, and to be contrasted with the dozens of theatrical "shilling shockers" that make free with similar material. James Lane Allen's *A Cathedral Singer* is a carefully wrought book, but it keeps sinking from sentiment to sentimentality as it idealizes maternal love and turns the Cathedral of St. John the Divine into a symbol. *Enoch Crane*, a novel left in a fragmentary state by the late Frank Hopkinson Smith, was completed by his son, F. Berkeley Smith, who made an earnest, if not very successful, endeavor to perform a delicate and difficult task. Mrs. Gertrude Atherton, in *Mrs. Balfame*, wasted talents, that might have been better spent, upon a murder and mystery story. Mrs. Margaret Deland departed as far from her accustomed field in *The Rising Tide* as did Mrs. Atherton in *Mrs. Balfame*. The former book presents a feminist heroine, and sets her off against the womanly woman, with her softer charms. A distinguished contribution to the literature of the

year was Mrs. Edith Wharton's *Xingu*, a collection of brilliant and finished short stories.

The books just named are from the pens of old favorites, highly valued, and justly so. Nor do these names complete the list of those who by earlier work have proved themselves worthy of special attention. To Mary S. Watts we have come to look for arresting interpretations of American life and character—an expectation which her latest novel, *The Rudder*, does not disappoint. Genuine interpretation in like fields characterizes the work of Dorothy Canfield, who is represented by the short stories in *The Real Motive*. Kathleen Norris, changing her usual scene for New York and a country colony adjacent thereto, would seem to be presenting through an interesting novel, *The Heart of Rachel*, a conviction that painless divorce is a social fallacy. Twice during 1916 Theodore Dreiser appeared. The sincerity and power of a naturalist, who, by his sympathetic insight and his art, has illuminated various phases of life and character, are evident, not only in his *Plays of the Natural and the Supernatural*, but also in *The Bulwark*, where we watch the strenuous efforts of Quaker parents to keep the younger generation from backsliding from the old doctrine and discipline. Booth Tarkington, in *Penrod and Sam*, gave his readers the pleasure of meeting again as genuine a youngster as has found his way into American literature of the last decade, and, in *Seventeen*, recounted with comic effect, and with truth to the tender sensibilities of adolescence, the puppy-love of a youth of seventeen summers. Meredith Nicholson, another Hoosier novelist, in *The Proof of the Pudding* reclaims a young wastrel in a story whose realistic integrity is diluted, as this writer's work is apt to be, by the tricky spirit of romance. A critical interpretation of American town life is wrought into Miss Alice Brown's *The Prisoner*, which is a kind of parable of prisoners of the conventions. Less fresh and authentic than the stories in which the late Jack London (q.v.) presented his sailors, miners, and titanic drinkers and bruisers is that author's *The Little Lady of the Big House*, where we are plunged into a world of motor cars, country houses, fine clothes, diamonds, and champagne. To Jack London's credit also the year has added a volume of short stories, *The Turtles of Tasman*. Penetrating portraiture, thoughtful analysis of social types, and good artistry mark Juliet Wilbur Tompkins's *The Seed of the Righteous*. Over against the rather rose-tinted picture of the plutocrat in Canon Hannay's *Gossamer* may be set the dark figure of the high financier in William Allen White's *God's Puppets*. There is good characterization and a good sea-story in Oswald Kendall's *The Martin Connor*. In Arthur Sherburne Hardy's *Helen* we meet an interesting group of people and are introduced to good cosmopolitan society. Anna Katharine Green, faithful practitioner of the detective story, produced in 1916 the tales assembled in *To the Minute*—in which she is by no means at her best. From Fannie Hurst came the short stories published as *Every Soul Hath Its Song*; from Eliza Calvert Hall the Kentucky stories *Clover and Blue Grass*; from Don Marquis the lightest and brightest satirical sketches that have appeared for many a day—the chronicles of the fair and indescribably cultured *Hermione*, and her "little group of seri-

ous thinkers." Rupert Hughes concerned himself to good purpose with the life of the hour in his *The Thirteenth Commandment*, where we meet a feminist heroine who combines a passion for fine clothes with a passion for economic independence; and in *Clipped Wings* wrote a novel concerned with the actor's calling. Mirth-provoking comedy and a good love story combine to commend Alice Duer Miller's *Come Out of the Kitchen*. In Nathan Kussy's *The Abyss*, the story of a Jewish lad in the underworld, there is marked power and sincerity. A Jewish boy, come from the Russian Pale to America, is the protagonist of Elias Tobenkin's *Witte Arrives*, a story good so far as its picture of Jewish-American life goes. Life in a New England village that hangs upon the skirts of a large city gives its material to Basil King's *The Side of the Angels*. Thoroughly American in style, theme, and character are Irvin Cobb's *Old Judge Priest*, and his short stories, grave and gay, entitled *Fiddle, D.D.!* and *Local Color*. Love, disillusionment, divorce, and love once more are all a part of Ellen Glasgow's *Life and Gabriella*. In *The Real Adventure* Henry Kitchell Webster posed the problem confronting a married couple who early discover that all they have in common is sex-instinct; and in *The Painted Scene* told faithfully realistic stories of theatrical life. Powerfully conceived and skillfully constructed is Sidney L. Nyburg's *The Conquest*, in whose hero love of power and love of a woman contend for the mastery. Ernest Seton Thompson offered a volume of stories—*Wild Animal Ways*; and beguiling stories of quite a different stripe are assembled in H. G. Dwight's *Stamboul Nights*. In Beatrice Forbes-Robertson Hale's *The Nest Builders* the home-making woman and the freedom-loving artist are at cross purposes.

Again in 1916, the historical novelists were busy with novels of the past, remote or near. T. Everett Harré attempted with dubious success, in his *Behold the Woman*, a tale of the fourth century, to write a novel of Christian edification. Faithful to the facts of history, if anachronistic in motivation and characterization, is Clarice M. Cresswell's romance of the Spanish Moors of the tenth century, *The Making and Breaking of Almansur*. Narrative interest, and a mass of romantic historical fact, borne buoyantly on the stream of the story, characterize Edward Lucas White's *El Supremo*, a tale that borrows its name from the title of Francia, the dictator of newly born Paraguay. Frank Sumner Townsend found a happy way to vitalize a page of history in his *Hugh Graham*, an historical novel of pre-Revolutionary days; Emerson Hough, in *The Magnificent Adventure*, told of Aaron Burr's conspiracy, and the Lewis and Clark expedition. John W. Appel's *The Light of Parnell* carries the reader from John Brown's raid through the Civil War; and Grace King's *The Pleasant Ways of St. Medard* deals with New Orleans in the Reconstruction period. With Zane Gray's *The Border Legion* one is set down in the Idaho of a half-century since, while Rex Beach's *Rainbow's End* plunges into the desperate doings in Cuba of the days of Weyler and Gomez.

Close appraisal of comparative values is here, as elsewhere in this article, difficult or impossible. Of the books now to be mentioned some should doubtless receive more, some less attention. In one group, romance and adventure

are the chief stock in trade: here stand Robert W. Chambers's *The Girl Philippa*; Frank H. Spearman's Wild-Western *Man of Music Mountain*; Harold Bell Wright's Southwestern story, *When a Man's a Man*; James B. Connolly's *Head Winds*, tales of adventure on sea and land; Rex Beach's stories, northern and tropical, *The Crimson Gardenia*; Richard Matthews Hallett's *Trial by Fire*, a novel of the Great Lakes; James Oliver Curwood's *The Haunted Woman*—the scene in the Northwest; and Stewart Edward White's *The Leopard Woman*—African in setting. All compact of Wall Street are the *Wall Street Stories* of Edwin Lefevre and the same author's *The Plunderers*, and Frederick Orin Bartlett's *The Wall Street Girl*. A sentimental prettifying of life is achieved in Eleanor Porter's *Just David* and *Six Star Ranch*, Anne Warwick's *The Unpretenders*, Harriet Comstock's *The Vindication*, and Rachel Sweet Macnamara's *Drifting Waters*. George Barr McCutcheon's popularity will not be diminished by *From the Housetops* and *The Light that Lies*, nor Mary Roberts Rinehart's by *Tish*, nor Harry Leon Wilson's by *Somewhere in Red Gap*, nor George Madden Martin's by *Emmy Lou's Road to Grace*, while Owen Johnson's *The Woman Gives*, a story of Bohemian New York, will hardly enhance either his popularity or his literary prestige. From Robert W. Chambers came, in addition to the book of his above named, the Adirondack and Florida stories entitled *The Better Man*; from Gouverneur Morris *We Three*; from Justus Miles Forman the posthumously published international novel *The Twin Sisters*; from Peter Clark Macfarlane the autobiographic *Held to Answer*; from Sherwood Anderson the Middle-Western novel *Windy Macpherson's Son*; from James Willard Schultz *Blackfeet Tales*, a noteworthy contribution to Indian lore; from Helen R. Martin the Pennsylvania-Dutch novel *Her Husband's Purse*; from Corra Harris *A Circuit Rider's Widow*, a novel telling of the life of a small Georgia town; from Grace Livingston Lutz *A Voice in the Wilderness*, which tells of the experiences of a young Eastern college girl who teaches a school in the wilds of Arizona; from Reginald Wright Kauffman *The Mark of the Beast*, in which an unsavory theme is poorly handled, and *The Silver Spoon* with a wealthy New Yorker for protagonist; from Sarah Clegghorn *The Spinster*, which considers in the form of fiction the place of the spinster in modern life; from Olive Higgins Prouty *The Fifth Wheel*, where we meet a heroine who turns from an empty fashionable life and brilliant match to the work-a-day world; from Mildred Aldrich nine stories, under the title *Told in a French Garden*; from Prof. Edwin Herbert Lewis a first novel, *Those About Trench*, incoherent in structure, but variously interesting.

POETRY. *English*. Maurice Hewlett in 1916 brought together, under the title *Gai Saber, Tales and Songs*, verses on varied themes, not forgetting themes connected with the war. John Masefield's *Good Friday and Other Poems* presents a phase of that poet's gift quite different from that which produced the realism of *The Widow in the Bye Street*: it contains a long dramatic poem in couplets, together with sonnets and a miscellany of short poems. In *Wolf's-Bane*, John Cowper Powys presented a group of his verses remarkable, among other qualities, for their command of old-fashioned me-

ters, and for the diversity of their moods and themes. The war poems and other lyrics, and the plays, with their fine blank verse, of Wilfrid Wilson Gibson's *Battle and Other Poems* were a notable contribution to the year's poetry. So also were the poems of Gordon Bottomley—*Laodice and Danæ*—with their splendidly picturesque quality, and their note of the morbid and exotic. In *The Listeners* of Walter de la Mare appeared a volume of good promise. Notable, also, in the poetry of the year were: Francis Ledwidge's *Songs of the Fields*—the author a poet in the Royal Enniskillen Fusileers; James Stephens's *Green Branches*, which laments the tragic ending of the three young Irish poets who were leaders in the recent Irish rebellion; William Butler Yeats's *Responsibilities and Other Poems*; and Padraic Colum's *Wild Earth, and Other Poems*.

An important poetic anthology of the year, though not of the year's verse, was that edited by Robert Bridges, and entitled *The Spirit of Man*. A second anthology, *Georgian Poetry*, a judicious collection of contemporary verse, evinces a quickened inspiration in the British Muse, and offers much to reward a reader.

*American*. Edward Arlington Robinson, second to none among living American poets, sustained his reputation with *The Man Against the Sky*, verses that hold to the classic forms, and are essentially original enough to dispense easily with the novelties of free verse or shackled prose. Percy Mackaye was represented by selections from his work in the two-volume *Poems and Plays* and by the Shakespeare masque, *Caliban by the Yellow Sands*. Dramatic force and strong human interest, as well as more purely poetic qualities, distinguish Hermann Hagedorn's *The Great Maze and The Heart of Youth*. In *Songs and Satires*, Edgar Lee Masters is more varied in theme and manner than he was in his *Spoon River Anthology*. Paul Shivel, a farmer-poet, raises the simple realities of rural life to the poetic level in *Stillwater Pastorals*. Cale Young Rice's *Earth and New Earth* contains poems both lyric and dramatic. A distinctive imaginative quality and his own original way of expressing himself poetically mark the verses of Benjamin de Caseres, published as *The Shadow-Eater*. Carl Sandburg showed himself a vers librist of power in *Chicago Poems*, which pity the poor and lash selfish and plutocratic wasters. Notable also among the poems of the year were: Walter Conrad Arensberg's *Idols*, Louis Untermeyer's "*—and Other Poems*"; Charles O'Donnell's promising *The Dead Musician*; the pleasant rhymes of Charles Hanson Towne's *To-day and To-morrow*; the late Madison Cawein's *The Cup of Comus*; Benjamin R. C. Low's *The House That Was and Other Poems*; William Alexander Percy's *Sappho in Levkas and Other Poems*; Newbold Noyes's tuneful *Echo*; Geoffrey C. Faber's *Interflow*; the uneven but often fine work in George Sterling's *Beyond the Breakers*; Dana Burnet's *Poems*; Arthur Stringer's *Open Water*; Vachel Lindsay's *General William Booth Enters Heaven and Other Poems*; the *Poems* of Alan Seeger, a young American who served in the French Foreign Legion and was killed in a recent Allied drive; Clinton Scollard's *Italy in Arms and Other Poems*; Louis V. Ledoux's *The Story of Eleusis*, remarkable for its evenly fine poetical texture and its ex-

pression of fresh emotion through classic myth and imagery; and Miss Amy Lowell's *Men, Women, and Ghosts*, in free verse.

The ladies did their part in the poetry of 1916. Miss Edith Thomas arraigned war in her *The White Messenger and Other War Poems*, and with that volume and her *The Flower from the Ashes* sustained the enviable reputation she has won. Musical quality, happy phrasing, and, occasionally, vigor and distinction, characterize Mabel Parker Hudson's *Script of the Sun*. In Ruth Comfort Mitchell's (Mrs. Young's) *The Night Court and Other Poems*, there are sincerity and power; and in the posthumously published *Verse* of Adelaide Crapsey genuine inspiration and a finished art. Ruth McEnery Stuart was represented by a volume of dialect verse—*Plantation Songs and Other Verse*. In 1916—more than a decade after the author's death—appeared Alice Freeman Palmer's *A Marriage Cycle*, remarkable for its depth and glow of feeling, and for its fine, though far from flawless, art. There is poetic beauty as well as glowing sympathy for the poor and the unfortunate in Margaret Widdemer's *Factories and Other Lyrics*. An arresting quality draws one to the poems—*Songs to Save a Soul*—of Irene Rutherford McLeod, a young poetess, for whose future this volume promises well.

During the year the anthologists were at work. Alfred Noyes edited, under the title *A Book of Princeton Verse, 1916*, a collection of poems by Princeton undergraduates; Alfred Kreymborg made an anthology of the newer free verse "formless forms" of American poets, entitled *Others*; the indefatigable William Stanley Braithwaite aimed to cull the choicest poetic blossoms from the periodicals of the year in his *Anthology of Magazine Verse for 1916 and Year Book of American Poetry*; Charles G. Blanden and Minna Mathison edited the *Chicago Anthology*; Mrs. Waldo Richards assembled the collection *High Tide*; and J. W. Cunliffe published *Poems of the Great War*.

REFERENCE WORKS. The year saw the completion of a second edition of the NEW INTERNATIONAL ENCYCLOPÆDIA, in 24 volumes, publication of which was begun in 1913. *The Cambridge History of English Literature* was further extended by the appearance of vol. xii, dealing with "The Nineteenth Century."

ESSAYS, LITERARY CRITICISM, AND LITERARY BIOGRAPHY. *English*. The tercentenary of Shakespeare's death was honored by a variety of appropriate publications. A new edition of Sir Sidney Lee's *Life of Shakespeare*, incorporating the latest results of scholarship, appeared. This book, all critical deductions made, still holds its place as the standard biography. From Sir Sidney came also a clear survey of the influence of the renaissance in Italy on the English bard—*Shakespeare and the Italian Renaissance*. An imposing volume of miscellaneous studies, entitled *A Book of Homage to Shakespeare*, and edited by Israel Gollancz, was a distinguished book in its field. Mrs. C. C. Stopes, in *Shakespeare's Industry*, made a series of studies designed to show what antecedent long labor must have conditioned the writing of the plays and poems. Those whose convictions impel them to attempt an uprooting of faith in the Shakespearean authorship of the plays were of course not slumbering through the tercentenary, as G. G. Green-

wood's *Is There a Shakespeare Problem?*, which would rob Shakespeare to the advantage, not of Bacon, but of some unidentified poet, and as James Phineas Baxter's Baconian *The Greatest of Literary Problems* bear witness.

In 1916 George Earle Buckle continued W. P. Monypenny's interminable *Life of Disraeli* by the addition of a fourth volume covering the years 1855-1868. In the *Correspondence of Gray, Walpole, West, and Ashton (1734-1770)* 100 unpublished letters were collected. Edmund Gosse's enlightening and urbane essays, *Inter Arma*, were concerned with French topics bearing upon the war. In entitling his volume of essays *The War for the World* Israel Zangwill intended to indicate as his central theme the war of reason and justice against force and greed. It was on the war, largely, that John Galsworthy reflected in the papers published as *The Sheaf*, and the same concern occupied G. K. Chesterton in his *The Crimes of England*, and H. G. Wells in *What Is Coming: A European Forecast*. The interest attaching to the book of a man who has been a part of the history of his time belongs in full measure to Earl Curzon's *Subjects of the Day*. An illuminating study of Blake as a mystic, *Vision and Vesture*, came from the hand of Charles Gardner. And from the hand of John F. Harris came *Samuel Butler*, a critical biography of the author of *Erewhon*. Edward Lewis wrote a sympathetic study of a many-sided and interesting man in his *Edward Carpenter*. Other critical biographies were: R. Thurston Hopkins's workmanlike and comprehensive *Rudyard Kipling*; Harold Child's *Thomas Hardy*; Julius West's lively *G. K. Chesterton*; Hugh Walpole's valuable *Joseph Conrad*; Ford Maddox Hueffer's *Henry James*, which can hardly hope, be it said by the way, to be accepted as a standard study of its subject, and Rebecca West's *Henry James*. Interesting for what it tells of the "poet of democracy" and his friends and thought-provoking at many points are Edward Carpenter's reminiscences in his *My Days and Dreams*. In *English Poets and the National Ideal*, Prof. E. De Sélin-court studied the great expressions of the national spirit from Shakespeare on; in *Old Familiar Faces* Theodore Watts-Dunton reminisced richly and delightfully; in *The Peace of the Augustans* Prof. George Saintsbury made a study of eighteenth-century literature, which is not up to the best standard of the work of that *doctor universalis*; in *The Poets Laureate of England* W. Forbes Gray was adequate, critically and biographically. Wide learning, stimulating freedom of thought, and gusto in the writing are qualities of Joseph McCabe's discussion of several present-day leading questions in his *The Tyranny of Shams*. Interesting for the light it threw upon the moods and ideas of its author was W. B. Yeats's *Reveries Over Childhood and Youth*. Remarkable for their rare literary quality, the fertility of their thought, and in other ways, were the essays of "Æ"—George W. Russell—entitled *Imaginations and Reveries*. Subtle studies of a strangely ill-sorted company were assembled in Arthur Symons's *Figures of Several Centuries*. E. V. Lucas published a volume of essays, in which he was graver than his wont, appropriately entitled *Cloud and Silver*.

American. American, as well as English, scholarship fitly observed the Shakespeare tercentenary, and the *Shakespearian Studies*, con-

taining 18 essays, by members of the Department of English and Comparative Literature of Columbia University, was probably not surpassed by any critical publication called forth by the occasion. There is fine scholarship, too, in the *Shakespeare Studies*—13 of them there are—made by members of the English Department of the University of Wisconsin. Prof. George Lyman Kittredge's address on Shakespeare, published by the Harvard University Press, was an admirable performance, as was, also, in a very different way, Prof. Ashley H. Thorndike's comprehensive survey of the Elizabethan theatre in his *Shakespeare's Theatre*.

Prof. J. B. Fletcher of Columbia, in his *Dante* (Home University Library) wrote a volume sure to rank with the best interpretative criticism in English of the great poet—a book, however, for the initiated. The neophyte in Dante study will find *Dante: How to Know Him*, by Prof. Alfred M. Brooks, a helpful volume containing translations, summaries, and notes preceded by an introduction. A genial and pleasant study of *Wordsworth*, though no way remarkable, was written by Prof. C. T. Winchester for the *How to Know Him* series. To the same series Prof. W. P. Trent of Columbia contributed an informational volume on Daniel Defoe. Some new light is thrown on the closing years of Poe by *Poe's Helen*, the life of Mrs. Sarah Helen Whitman, who was engaged to Poe—a book from the pen of Caroline Ticknor. A startling feature of Prof. C. Alphonso Smith's biography of "O. Henry" (Sydney Porter) was its revelation of the fact that the popular short-story teller served a term in the Ohio State Penitentiary—and unjustly, Professor Smith contends. A careful and life-like little sketch was drawn by Clara E. Laughlin in her *Reminiscences of James Whitcomb Riley* (q.v.), the Hoosier poet whose death is to be recorded with sorrow. Bright sidelights were thrown upon a number of men who were doing a noteworthy part of the world's work in art and letters in the last quarter of the nineteenth century in Mrs. Elizabeth Pennell's *Nights*. Rich in varied interest was William Winter's *Vagrant Memories*, a companion volume to his earlier *Other Days*, and the same is true of *The Letters of Richard Watson Gilder*, edited by Miss Rosemund Gilder—a record of the influential part Mr. Gilder played in American letters, art, and civil life. Sure of a place of honor in its field is W. D. Howells's *Years of My Youth*, an autobiography devoted to the author's boyhood and young manhood in Ohio. An interesting epistolary collection was *The Letters of Henry Brevoort to Washington Irving*, edited by George Hellman.

The history of recent tendencies in fiction was written by Prof. William Lyon Phelps in his *The Advance of the English Novel*. A new theory of the sentimental drama of the eighteenth century was advanced in Dr. Ernest Bernbaum's stimulating analytical study, *The Drama of Sensibility*. The dramatic critic of the New York *Evening Post*, Mr. John Ranken Towse, wrote a valuable volume of theatrical criticism and reminiscence—*Sixty Years of the Theatre*.

John Burroughs's contribution of the year was a volume of studies of nature and philosophical reflections, *Under the Apple Trees*. Nimbly written, humorous, and in familiar vein are the essays by Prof. Dallas Lore Sharp entitled *The*

*Hills of Hingham.* From Woodrow Wilson came this year a substantial volume of essays, well worthy of attention—*On Being Human*; and from Elihu Root came a notable book, *Addresses on International Subjects.*

**HISTORY, GENERAL BIOGRAPHY, AND MEMOIRS.**  
*English.* Prof. T. F. Tout centred his attention upon a turning point in the constitutional and administrative history of the realm in *The Place of the Reign of Edward II in English History.* In writing his *History of France* (3 vols.), J. R. Moreton Macdonald met a need, and made a book of distinctive merit. It is a valuable synthetic collection of documentary material relating to the years between 1756 and 1858 that Prof. J. Ramsay Muir offered in *The Making of British India.* A Boer revolt and its suppression under Botha is a chapter of contemporary history set forth by P. J. Sampson under the title *The Capture of De Wet*, and William Charles Scully's *A History of South Africa* is a good account of development in South Africa. That vigorous and versatile writer, Joseph McCabe, in his *Crises in the History of the Papacy*, followed the careers of representative popes, and filled in the gaps with summaries of intervening periods. A tragic page of contemporary history was written by John Masefield in his *Gallipoli*, which is also a moving *apologia* for a colossal failure. In a monograph devoted to clearing up certain important points in Roman and ancient German history, William A. Oldfather and Howard Vernon Cantor collaborated.

Malcolm William Wallace's *Life of Sir Philip Sidney*, a book of 1916, will probably take its place by Fox-Bourne's *Memoir* as an authority on Sidney's life and character. With Sir Edward Cook's *Delane, of the Times* the *Makers of the Nineteenth Century Series* opened auspiciously. Lord Charnwood's *Lincoln* was a notable biography. Alfred Russel Wallace, scientist and close friend of Darwin, was the subject of a *Life* by James Marchant. Quite ample justice was done to the character and career of R. H. Benson in *The Life of Monsignor R. H. Benson*, by C. C. Martindale, S. J. Connected by blood and friendship with aristocratic and politically important families, Shane Leslie, invalided from his regiment, was in a position to write, and did write, a sketchy, anecdotal, and interesting book under the title *The End of a Chapter.* Diplomat, sportsman, author, and other things besides, Lord Redeadale tells of his acquaintance with many of the men and women who made history, literature, and art in Europe for half a century, in his two-volume *Memories.* A good biography, sweeping between its covers much South African history, was Harold Spender's *General Botha.* A deal of more and less significant personalia was brought together in *The Journals of Lady Knightley of Fawsley*, edited by Julia Cartright. Completing in this third volume entitled *The Widowhood of Queen Victoria* his study of the Queen's life and character, Clare Jerrold, faithful biographer, leaves his reader well aware that, if Victoria is to be idealized, the process must be left to purblind patriotism, and not entrusted to a clear-eyed and conscientious chronicler and analyst. *The Life and Letters of Sir John Henniker Heaton, Bart.*, was published by his daughter, Mrs. Adrian Porter. The career of a witty and dashing gentleman and gallant lover was entertainingly presented in *The Chevalier de Boufflers*, by Neta

H. Webster. In *A Noble Woman*, Ernest Protheroe wrote the story of Edith Cavell's life and tragic death. He also wrote a book on Lord Kitchener. To the endless making of books on Napoleon was contributed in 1916 *Letters of Captain Englebert Lutyens*, which Sir Lee Knowles edited, and which tells of the last days of the Emperor. British men in various walks of life are discussed by George W. E. Russell in his *Portraits of the Seventies.* *Jeffrey Amherst*, by Lawrence Shaw Mayo, is a biography of the English Baron who is associated with the conquest of the French in Canada.

*American.* A valuable contribution, alike to local and continental history, was made by Dr. Charles Edward Chapman in *The Founding of Spanish California.* *The Mastering of Mexico*, by Kate Stephens, is a condensed version of the account one of the chief soldiers of Cortez, Bernal Díaz del Castillo, gave of his part in the conquest of Mexico. An important book, composed largely of letters written between 1542 and 1706, entitled *Spanish Explorations in the Southwest*, and well edited by Edward Eugene Bolton, was this year added to the *Original Narratives of American History* series. Prof. Robert Granville Caldwell embodied no little valuable material of his own unearthing in his *The Lopez Expeditions to Cuba, 1848-1851.* A study of Reconstruction in Arkansas was made by Gov. Powell Clayton in *The Aftermath of the Civil War in Arkansas*, and a kindred study, *Reconstruction in Georgia*, by Dr. C. Mildred Thompson. In Dr. John W. Burgess's good study, *The Administration of President Hayes*, the eulogistic note is everywhere struck. H. C. Wright's *History of the Third French Republic* carries French history from 1870 to 1914 in a brief and compact chronicle. From Francis Hackett came *Ireland: A Critical Examination.* Strong on the documentary side, if not very strong on the interpretative side, was Dr. Raymond du Bois Cahill's *The Sovereign Council of New France*, a Columbia doctoral thesis. *England and Germany, 1740-1914*, by Prof. Bernadotte Everly Schmitt, is an important study in international history involving an analysis of conditions that led up to the great war. A noteworthy book in its field was Prof. Knut Gjerset's *History of the Norwegian People* (2 vols.). Free from any bias of the hour is Prof. R. H. Fife's *The German Empire Between Two Wars.* The year added to the *Harvard Historical Studies* Robert Howard Lord's *The Second Partition of Poland.* From first-hand study and observation came John Foster Fraser's *Russia of To-day.* *Columbia University Studies in History* were increased by the appearance of Dr. Paul H. Clements's *The Bower Rebellion*, while from the pen of Jefferson Jones came *The Fall of Tsingtau*, and from Gardner L. Harding *Present-Day China.* Herbert Adams Gibbons has to his credit *The Foundation of the Ottoman Empire*, which together with William Warfield's *The Gate of Asia*, provides informative material on the peoples and political conditions of the past in regions now the Eastern theatre of the great war. In *Our Military History* Maj.-Gen. Leonard Wood pleaded vigorously for American adaptation of Swiss or Australian systems of compulsory military service. Into *American Diplomacy* Charles Russell Smith skillfully condensed a century and a quarter of diplomatic history and, in *America's Foreign Relations*,

Prof. Willis Fletcher Johnson made a substantial contribution to this subject. Of the varied relations between Jew, Greek, and Roman, an admirable, scholarly account was given in Dr. Max Radin's *The Jews Among the Greeks and Romans*.

Interesting biographies and memoirs abounded in 1916. More remarkable for comprehensiveness than for literary quality was Allen C. Clark's *The Life and Letters of Dolly Madison*. With charming simplicity, Maud Howe Elliott, assisted by Florence Howe Hall, told the whole story of their mother's life in *Julia Ward Howe, 1819-1910*. A good study of Lincoln as lawyer was made by John T. Richards in *Abraham Lincoln, the Lawyer-Statesman*. Charles S. Olcott wrote a popular biography, the *Life of William McKinley* (2 vols.); Charles G. Washburn, a study of Colonel Roosevelt's character and career in *Theodore Roosevelt*; Prof. Eugene Brooks the eulogistic *Woodrow Wilson as President*; George Creel—with unstinted admiration—his *Wilson and the Issues*; Prof. Henry J. Ford a study of the man and his career—*Woodrow Wilson: The Man and His Work*; and Judge William M. Ransom a campaign document, *Charles E. Hughes, the Statesman as Shown in the Opinions of the Jurist*. In *Booker T. Washington: Builder of a Civilization*, Lyman Beecher Stowe and Emmett J. Scott collaborated. A good life of the distinguished Governor of Massachusetts was written by Lawrence B. Evans in his *Samuel W. McCall*, and Gamaliel Bradford published penetrating studies of men of the Civil War Period in his *Union Portraits*. The filibuster William Walker is the protagonist of Prof. William O. Scroggs's absorbing *Filibusters and Financiers*. Interesting biographically and socially was the *Life, Diary, and Letters of Oscar Lovell Shafter*—the subject of the book an Associate Justice of the Supreme Court of California. Sketches of important actors in contemporary Mexican life and records of recent notable diplomatic episodes constitute the more arresting pages of Mrs. Edith O'Shaughnessy's *A Diplomat's Wife in Mexico*. Frank and sprightly is the brief autobiographic sketch, *Geraldine Farrar: the Story of an American Singer*. Under the title *A Master Builder*, Bishop Charles H. Brent wrote the life of Bishop Satterlee. *Francis Asbury*, by Dr. Ezra Squier Tipple, is a biography of the real organizer and founder of the Methodist Episcopal Church in America. Stephen Chalmers wrote an appreciation of Edward Livingston Trudeau (see also below) entitled *The Beloved Physician*. Among reminiscences and journals should be mentioned: *The Journals of Captain Meriwether Lewis and Sergeant John Ordway, Kept on the Expedition of Western Exploration, 1803-1806*, containing material which escaped Dr. Thwaites; the valuable *Diary of James Galatin: Secretary to Albert Gallatin: 1813-1827*; *Reminiscences of Frederick W. Seward*; Richard Whiteing's *My Harvest*, containing delightful recollections of London, of Paris, of Spain in revolution, of Russia; Everett P. Wheeler's *Sixty Years of American Life*; and the *Autobiography of Dr. E. L. Trudeau*, founder of Saranac sanitarium, and pioneer in the open-air treatment of tuberculosis—an extraordinary life history.

RELIGION. *English*. The proper relation of Church and State was the theme of Dr. Peter

Taylor Forsyth's *Theology in Church and State*. Sprung, no doubt, from that fertile seed of trouble, the Kikuyu incident, appeared Canon A. J. Mason's *The Church of England and Episcopacy*, which occupies itself with the nature of the Episcopacy, the validity of ordination, the sacraments, etc., and aims, surely, at the Kikuyu fraternizing that so offended Anglican regularity. J. Estlin Carpenter contributed to *American Lectures on the History of Religion* his *Phases of Early Christianity*. Lectures by nine eminent Churchmen, written from the Anglican angle, were assembled in *Our Place in Christendom*. Canon Driver's fine, illuminating scholarship was displayed in his *The Ideals of the Prophets*. The heart-searching induced by the war was at work in Rev. William Temple's *Church and Nation*, in Dean H. Henson's *War-Time Sermons*, in Charles E. Osborne's *Religion in Europe and the World Crisis*, in Prof. Percy Gardner's *The Faith and the War*. The adaptability of the ethical ideal of Christ to present-day problems was Hastings Rashdall's theme in *Conscience and Christ*. The ideal of Christian romanticism as St. Francis understood it is what Father Cuthbert set himself to expound in his *The Romanticism of St. Francis*. A sound account of Hindu metaphysical and religious thought was offered by R. W. Frazer in *Indian Thought Past and Present*, and a collection of interpretative studies in Hindu life and religion in *Religion and Dharma*, by Margaret E. Noble (Sister Nivedita). Henry Louis Jordan wrote a book—*Comparative Religion: Its Adjuncts and Allies*—on a subject which he has made his special province. With the two volumes of his history of Modern English Catholicism published this year—their title *The Sequel to Catholic Emancipation*—Monsignor Bernard Ward brought his chronicle down to the reestablishment of the hierarchy in 1850. The well-known historian of religious philosophy, Clement C. J. Webb, collected lectures he delivered at Oxford in *Studies in the History of Natural Religion*, treating his subject with the sure familiarity of a master.

*American*. A book dealing with social questions from the religious point of view—*Faith and Social Service*—came from the pen of Dean Hodges. Prof. I. J. Peritz wrote an admirable survey of Hebrew history entitled *Old Testament History*; Prof. F. L. Strickland attempted to harmonize science and Christian convictions in *Foundations of Christian Belief*; Bishop Frederick De Land Leete, from the view-point of one who regards the churches as the proper leaders in civic purification, presented his *The Church in the City*; and Dr. William DeWitt Hyde gathered into a book—*The Gospel of Good Will as Revealed in Contemporary Scriptures*—his Yale lectures. Adhering closely to current orthodoxy, Bishop E. H. Hughes wrote *The Bible and Life*, W. Davison *The Chief Cornerstone*, C. W. Laufer *The Incomparable Christ*. Broader in view were Joseph M. M. Gray's *The Old Faith in the New Day*; Mrs. Katrina Trask's *The Mighty and the Lowly*; H. S. Coffin's *Some Christian Convictions*; W. Elsworth Lawson's *The Master Light*; Frank H. Decker's *Christ's Experience of God*; Dr. Galusha Anderson's *Science and Prayer*, and Cyril Hopher's *The Fruits of Silence*. *The Religion of Experience* was by Horace J. Bridges of the Chicago Ethical Society. Dr. Joseph K. Greene's *The Levant* made

the benefit of Christian missions to the Turks its theme. A book of importance in its field was James Pratt's *India and Its Faiths*, a critical study of modern faiths in India. Julian K. Smyth championed the faith that is in him, as official head of the New Church (Swedenborgian), in *Certainties of Belief*. S. M. Zwemer's *Mohammed or Christ* is a book of special pleading, while *Mohammedanism* is a scholarly treatise on the relation of the faith of Islam to Christianity written by C. Snouck Hurgronje, a Dutch scholar, and published in the United States. A sane interpretation of mysticism to the average man was Prof. John Wright Bucham's *Mysticism and Modern Life*. A brief account of a cult killed by Christianity came from J. Pythian-Adams, its title *Mithraism*. Dr. Francis J. Hall, in *Creation and Man*, contends that science has not affected the Catholic doctrines concerning his theme.

TRAVEL AND DESCRIPTION, *English*. Prof. J. Y. Simpson, as a result of his travels and of his reflections upon probable *post-bellum* effects, wrote *Russia's Self-Discovery*; Stephen Graham in *Through Russian Central Asia* foresees Russian regeneration following upon the war, and great strides toward liberalism, and has much of interest to record upon a miscellany of subjects; and William Barnes Stevni blended history, description, and anecdote in *Petrograd, Past and Present*. In prose appeared *Our Summer in the Vale of Kashmir*, by F. Ward Denys, a description of the scenes which Moore presented poetically in romantic colors in *Lalla Rookh*. Marvellously vivid in description of the Great Bushmanland Desert of South Africa, its flora, fauna, and natives, is W. C. Scully's *Lodges in the Wilderness*; descriptively effective also, is *A City of the Dawn*, by the Rev. Robert Keable, an Anglican missionary, evidently at home amid east African scenes. Griffith Taylor, in his *With Scott: the Silver Lining*, told of Captain Scott, of the brave company he led, and of the scientific results of the Antarctic expedition. Primarily, though far from exclusively, of anthropological interest was Capt. Thomas Whiffen's *The North-West Amazons*. In *On Alpine Heights and British Crags*, George D. Abraham appeared as a scaler of numerous perilous mountain slopes.

*American*. Fresh, graphic, and substantial, especially, perhaps, where it is concerned with the Arizona journeys, South America, and the Indians, is Colonel Roosevelt's *A Book-Lover's Holidays in the Open*. Vivacity, humor, and a zest for rough travel made Mary Roberts Rinehart's *Through Glacier Park* a very readable book. The descriptions of splendors and beauties in Ruth Kedzie Wood's *The Tourist's Northwest* made this volume a potent lure to those free to roam the regions of which it tells. George Wharton James took a panoramic sweep over the West and Southwest in *Our American Wonderlands*. Millionaire residences are represented with appropriate sumptuousness in Porter Garnett's *Stately Homes of California*. A young Easterner turned ardent Westerner, George Palmer Putnam, wrote buoyantly of a section of the West now in the making in *In the Oregon Country*. Lively, picturesque, and full of studies of animal life was Harry A. Auer's *Camp Fires in the Yukon*. An admirable book, fruit of years of patient research, was L. Bradford Price's *Spanish Mission Churches of*

*New Mexico*. Following his peripatetic method, Harry A. Franck filled his *Tramping Through Mexico, Guatemala, and Honduras* with impressions and substantial information. Remarkable for its illustrations alone was Mrs. Wesley Butler's *Historic Churches in Mexico*. The Rev. J. A. Zahm of the Roosevelt Expedition had much of interest to say of the past of, and of present conditions in, Brazil, Argentina, Chile, Paraguay, and Uruguay, in his *Through South America's Southland* and, in saying it, concluded a series of three volumes. Social, political, and economic relations with South and Central America and with the West Indies are considered in Chester Lloyd Jones's *The Caribbean Interests of the United States*. An admirable traveling companion to the Lesser Antilles is A. Hyatt Verrill's *Isles of Spice and Palm*. Useful as an informing miscellany of information and as an historical summary is *Cuba Old and New*, by the newspaper correspondent, Albert G. Robinson. A book largely of scientific content, recording a trip along the coast of Western Cuba, was written by John B. Henderson, and published as *The Cruise of the Tomas Barrera*. Mrs. Katharine Fullerton Gerould recorded her observations and experiences in *Hawaiian Scenes and Impressions*. A notable chronicle of Arctic exploration was *The Last Voyage of the Karluk*, related by the *Karluk's* captain, Robert A. Bartlett, and written from this narrative by Ralph T. Hale. Now and again there is valuable matter in Maud D. Haviland's *A Summer in the Yenesei*, which chronicles a sojourn in a village of Siberian exiles. The result of his 12 years' residence in Peking was harvested by the Methodist Episcopal bishop, Dr. James W. Bashford, in *China—an Interpretation*. An open-eyed traveler's book, with special war-time appeal, was Arthur Ruhl's *Antwerp to Gallipoli*. Elizabeth Shepley Sergeant's *French Perspectives* opened interesting vistas upon French life.

FEMINISM. The year did not lack its quota of books dealing with feministic problems. A number of these have been noted above. The following may be mentioned here: Mrs. Walter M. Gallichan's ("C. Gasquoine Hartley's") *Motherhood*, a work which ranges wide in its studies of woman as a factor in social life; W. L. George's competent and suggestive *The Intelligence of Woman*, which champions, with sound sense, a rather advanced feminism. Paul Jordan Smith's *The Soul of Woman*, giving from an advanced point of view an account of feminist ideals as they have taken form in recent years; Florence E. Smith's *Mary Astell*, a substantial contribution to the history of woman's rights; *Anti-Suffrage Essays*, by Massachusetts women who had a hand in the victorious Bay State campaign of 1915; *Feminism*, by Mr. and Mrs. John Martin; *Problems of Women Solved*, by Anna Pratt Simpson, which tells of the work of the Woman's Board of the Panama-Pacific Exposition; an account of the International Conference of Women Workers at the Panama-Pacific Exposition, by Mrs. Mary Wright Sewall—*Women, World War, and Permanent Peace*; and Jane Adams's *The Long Road of Woman's Memory*.

LITTLE THEATRE. See DRAMA.

LIVE STOCK. See STOCK RAISING AND MEAT PRODUCTION.

LIVING, COST OF. See FOOD AND NUTRITION; PRICES.

**LI YUAN-HUNG.** A Chinese statesman, who became President of the Republic of China on the death of Yuan Shih-kai (q.v.), June 6, 1916. He was born in 1864. His early experience was gained in the navy, on a cruiser during the Chino-Japanese War, in the army, and as a student of fortifications in Japan. He had become so identified with the radical political group that when the revolution broke out at Wuchang in 1911 he was forced to take command of the revolutionary army. He helped to arrange for the Shanghai Peace Conference and after the abdication of the Manchus served under Sun Yat-sen as Vice-President of the republic, and in 1913 was reelected, Yuan Shih-kai then becoming President. Li also served as chief of the general staff of the army. When the President declared his intention of having himself made Emperor, Li resigned and identified himself with the Southern faction working to retain the republic. He returned to the support of Yuan when the latter gave up all idea of a coronation. It was expected that his succession to the presidency would satisfy the radicals. Indeed, in the preceding month, May, four of the provinces had already elected him to the office.

**LLOYD GEORGE, DAVID.** A British statesman, appointed prime minister Dec. 6, 1916. He was born in Manchester on Jan. 17, 1863, of Welsh parentage. His father, a schoolmaster, died at Liverpool in early manhood, and his son was left to the care of an uncle at Criscieth in Wales, where he was educated at the Llanystymdwy Church school and privately. He studied for the law, became a solicitor in 1884, and won a high reputation in Wales by his successful conduct of a lawsuit which involved the right of burial of non-conformists in the burying grounds of the Established Church. The decision upholding that right was confirmed by the Court of Appeal. In 1890 he was elected as a Liberal for Carnarvon Boroughs; but his first ten years in the House of Commons were not remarkable. It was not until the Boer War, to which he was fearlessly opposed, that the real strength and resourcefulness of his character became known. By his speeches against the war he became intensely unpopular, on one occasion barely escaping with his life from the fury of a Birmingham mob. After the close of the war his reputation rose rapidly, and in 1905 he was appointed president of the Board of Trade in the Campbell-Bannerman ministry. When Mr. Asquith became Premier in 1908 David Lloyd George was made Chancellor of the Exchequer, which position he held until late in 1915. During his term of office he was the protagonist of three measures whose discussion and enactment into law plunged Britain into a fever of excitement unknown since the days of the Reform bill of 1832. The first was a bill in 1908 for old-age pensions; the second was a radical budget in 1909, which not only increased the indirect taxes on tobacco and spirits, but added heavily to the direct income tax and introduced a revolutionary feature in the appropriation for the benefit of the state of 20 per cent of all increase in land valuation, with just exceptions for improvements. In 1911 he secured the passage of the National Insurance bill, a measure for the relief of the working classes against accident, sickness, old age, etc. During his activity in behalf of these measures he developed a resourcefulness, debating

power, and eloquence which proved equal to every emergency. The wrath of the aristocracy was turned upon him for his attack upon the unearned land increment, but in addition to his argumentative reply he reminded them that "aristocracy is like cheese; the older it is the higher it becomes." He was never at a loss for the scorching word or phrase, nor for the most telling appeal to popular sympathies. To these gifts were added the more important qualities of quick decision and of rapid accomplishment in great emergencies. He assisted Asquith in prosecuting the Parliament bill, which aimed under certain conditions to take away the veto power of the House of Lords, to a successful conclusion. In 1913 he was criticized for his part in the indiscreet purchase of shares in the American Marconi Wireless Company; but nothing dishonorable was proved against him. The same year he began a nation-wide campaign to restore the land to the people by breaking up the large estates; but the opening of the European war in August, 1914, put aside all domestic affairs. As Chancellor of the Exchequer he obtained an unprecedented budget and war loans; and in the Asquith coalition cabinet, formed May, 1915, he resigned his post to become Minister of Munitions. See *GREAT BRITAIN, History*; *WAR OF THE NATIONS*; also articles on *GREAT BRITAIN* in previous *YEAR BOOKS*.

**LOAN AND TRUST COMPANIES.** No section of American banking has expanded more rapidly than have the loan and trust companies. In 1916 some of the larger of these companies entered upon a new era in their history through the extension of their financial and commercial services and interests in foreign countries. Departments were established for handling foreign acceptances, particularly of bills connected with Central and South American trade. These companies, like other banks, also participated in foreign loans. On June 30, 1916, there were reported 1932 loan and trust companies, with total resources of \$7,654,000,000. This was an increase of 155 in their number and of \$1,326,000,000 in their resources during the year. Their loans and discounts on June 30th aggregated \$4,065,000,000, and their cash, \$1,477,000,000. Their capital aggregated \$530,000,000; surplus, \$637,000,000; and deposits, \$6,247,000,000. This last item was an increase of \$1,237,000,000 over one year earlier. The resources of the trust companies in those States showing the largest number of such banks were as follows: New York, \$2,620,079,040; Pennsylvania, \$1,075,745,007; Illinois, \$761,438,852; Massachusetts, \$521,611,568; Ohio, \$452,912,854; New Jersey, \$340,923,357; California, \$286,489,438; Missouri, \$172,379,852; Rhode Island, \$155,520,641; Maryland, \$107,158,833; and Connecticut, \$102,745,325.

**LOAN SHARKS.** An interesting aspect of the general movement for social betterment has been the effort to remedy the abuses attending the business of making small personal loans. Such loans are sometimes accompanied by collateral of various sorts, but are more frequently based on a pledge of salary or wages. Rates of interest have been exorbitant and collection of interest and loans has frequently been carried out in ruthless disregard of the welfare of borrowers. Consequently during the past few years extensive legislation has been secured which as



a rule has limited rates of interest on such loans to 3 per cent per month; all fees whatsoever have been eliminated; loan agencies have been required to secure licenses and to be bonded under State supervision; in addition the new laws require the lender to give the borrower a complete statement of all conditions attending the loan, and fix adequate penalties for violations.

**LEGISLATION.** In 1916 Massachusetts led in important legislation with two bills to protect borrowers. One of these provided that three-quarters of a man's wages shall at all times be exempt from assignment and that no assignment shall be valid unless assented to in writing by the wife and unless made out according to a standard form. The other law prohibits any lender from charging more than 3 per cent per month under any pretext and definitely establishes the manner in which the 3 per cent rate shall be computed.

A bill dealing with regulation of "loan sharks" after a hard struggle passed the Alabama Legislature, but was vetoed by the Governor. In Maryland a bill failed by a close vote. The District of Columbia bill made no substantial progress, while the Federal bill forbidding the use of the mails by lenders carrying on an interstate loan business at rates forbidden by the laws of one of the States affected still remained in its early stages.

**THE NATIONAL FEDERATION OF REMEDIAL LOAN ASSOCIATIONS** held its eighth annual convention in Detroit in early summer. Two new associations in Dayton and Omaha were added to the National Federation during the year, bringing the total membership up to over 40 societies in more than 35 cities in the United States and Canada. They employed more than \$17,000,000 in loan funds. The report of business in 1915 showed 875,000 loans aggregating \$29,000,000, a decided increase over the preceding year. These associations are not charitable but limit their dividends. They have actively aided in the enactment of restrictive legislation.

**ASSOCIATION OF SMALL LOAN BROKERS.** Organizations of State associations of licensed money-lenders have been effected in Ohio, Maryland, Pennsylvania, Illinois, Michigan, and New Jersey. These associations are made up in part of former loan sharks and in part of reputable loan companies which are not eligible for membership in the remedial loan federation because they are distinctly profit-seeking businesses. The avowed purpose of the State associations is mutual protection and the raising of standards in the money-lending business. They have instigated the arrest of unlicensed lenders and have aided in upholding the constitutionality of State laws. These State associations have formed the American Association of Small Loan Brokers. This organization seems likely to be an important factor in elevating the small personal loan business. It is undoubtedly a result of recently enacted laws which permit reasonable interest rates to companies which submit to State license and supervision.

**MORRIS PLAN BANKS.** In 1901 Arthur J. Morris of Norfolk, Va., devised a scheme for extending credit to workmen and other persons of small resources. In 1914 the Industrial Finance Corporation with \$7,000,000 capital was formed to promote banks formed on this plan. The unique feature of the plan is that loans may

be secured by any person either on collateral or on a note signed by himself and two other persons. In the latter case, in addition to the interest, a charge of \$1 for each \$50 loaned is made to cover the cost of investigating the parties to the plan. The plan also provides for the purchase of installment certificates in multiples of \$50 by means of weekly or monthly deposits which may be exchanged for investment certificates bearing 5 per cent interest. More than 30 such banks have been established.

In an opinion of Attorney-General Edward C. Turner, of Ohio, Morris plan banks which had been established in Cleveland, Canton, Springfield, and Youngstown with an aggregate capital of \$750,000 were denied privilege of operating in that State. The opinion held that though chartered as banks the Morris companies were not conducting a banking business; that the actual interest charges for loans were in excess of the rates allowed by the Ohio loan law of 1915; and that the sale of "installment certificates" was in violation of the law regulating bond investment companies, if, as these companies contended, such sale did not involve the making or paying of loans. Steps were taken to secure additional legislation which would give these companies a legal status in Ohio.

**SEE CREDIT UNIONS.**

**LOCKE, W. J.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, English.

**LOCKJAW.** See TETANUS.

**LOCKS.** See CANALS.

**LOCOMOTIVES.** See RAILWAYS.

**LOCOMOTIVES, ELECTRIC.** See ELECTRIC RAILWAYS.

**LODGE, HENRY CABOT.** Re-elected Republican United States Senator from Massachusetts Nov. 7, 1916. See MEXICO; UNITED STATES, *Congress*.

**LONDON.** See GREAT BRITAIN.

**LONDON, JACK.** An American author, died near Santa Rosa, Cal., Nov. 22, 1916. Born in San Francisco on Jan. 12, 1876, he was the son of a trapper and frontiersman who had come to that city. Inheriting his father's adventurous disposition, he went to sea at 17, visiting Japan and Bering Sea. In 1893-94 he tramped through the United States and Canada, partly to gather material for his Socialistic articles. He studied for a brief time at the University of California, but in 1897 joined the rush to the Klondike. He afterward started to be a newspaper correspondent in the Boer War, but was prevented by the censorship, went to London in 1902, and in 1904 was a newspaper correspondent in the Russo-Japanese War. He spent the remainder of his life chiefly in California, though interrupting it for journeys abroad by land and sea whenever the humor seized him. In 1906 he fitted out a 50-foot ketchrig yacht and started with his wife on a seven years' cruise around the world, but was forced by a tropical illness to abandon the cruise before it was completed. In 1914 he was a war correspondent in Mexico. London's literary activity had two main aspects: vivid description of outdoor life and adventurous struggle of which the background was his own experience; and Socialistic ideas and sympathies vehemently expressed, together with extreme pacifist principles. In 1915 he wrote a pamphlet entitled "A Good Soldier," in which he denounced the European war and the character and calling of a

soldier as commonly understood, the latter reaching "a depth beyond which we cannot go." The pamphlet was barred from the United States mails. His stories, full of impulsive action and primitive emotion, often sacrifice literary art to a rough virility of speech, but many of them are very popular. They include: *The Son of the Wolf* (1900); *The God of His Fathers* (1901); *A Daughter of the Snows* (1902); *The Call of the Wild* (1903), one of his most widely read books; *The Faith of Men* (1904); *The Sea Wolf* (1904); *The Game* (1905); *Tales of the Fish Patrol* (1905); *Love of Life* (1907); *Before Adam* (1907); *Lost Face* (1909); *Burning Daylight* (1910); *Smoke Bellew* (1912); *The Abyssal Brute* (1913); *The Valley of the Moon* (1913); *The Strength of the Strong* (1914); *The Mutiny of the Elsinore* (1914); *The Scarlet Plague* (1915); *The Star Rover* (1915); *The Little Lady of the Big House* (1916). London's Socialistic or sociological volumes are: *The People of the Abyss* (1903), impressions gleaned from an observation of London slum life; *The Kempton-Wace Letters* (1903); *The War of the Classes* (1905); *The Iron Heel* (1908); *Revolution, and Other Essays* (1910); *John Barleycorn, or Alcoholic Memoirs* (1913).

**LONG, WALTER HUME.** See GREAT BRITAIN.

**LOPOKOVA, LYDIA.** See MUSIC, *Ballet*.

**LORTAT, ALBERT.** See MUSIC, *Artists*.

**LOS ANGELES AQUEDUCT.** See AQUE-DUCT.

**LOUISIANA. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 1,843,042. The population in 1910 was 1,656,388.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn ..... 1916	2,134,000	44,814,000	\$42,125,000
..... 1915	2,200,000	45,100,000	28,864,000
Oats ..... 1916	110,000	2,090,000	1,421,000
..... 1915	120,000	3,000,000	1,650,000
Rice ..... 1916	443,800	20,392,000	18,353,000
..... 1915	401,000	13,714,000	12,343,000
Potatoes ... 1916	25,000	1,625,000	2,714,000
..... 1915	28,000	1,428,000	1,357,000
Hay ..... 1916	260,000	429,000	4,719,000
..... 1915	250,000	a 438,000	4,511,000
Tobacco ... 1916	200	90,000	25,000
..... 1915	800	b 126,000	38,000
Cotton ... 1916	1,203,000	440,000	40,205,000
..... 1915	990,000	c 360,000	18,270,000

a Tons. b Pounds. c Bales.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments..	2,516	2,211
Average number of wage earners .....	76,165	77,665
Capital invested .....	\$221,816,000	\$261,635,000
Wages .....	33,386,000	39,544,000
The value of materials used	134,865,000	157,886,000
The value of products .....	228,949,000	255,313,000

**MINERAL PRODUCTION.** The output of petroleum in the State in 1915 exceeded the output of 1914 by 3,882,104 barrels, or 27 per cent. It established a new record for production of

oil in the State. The total production was 18,191,539 barrels, valued at \$10,804,653.

**TRANSPORTATION.** The railway mileage of the State including main track and branches on June 30, 1916, was 5316. The railways having the longest mileage are the Texas and Pacific, 805; the Louisiana Railway and Navigation Company, 342; the Louisiana and Texas and Steamship Company, 416; the St. Louis, Iron Mountain, and Southern Railway, 572.

**EDUCATION.** The school population of the State included in 1916, 310,562 white children and 227,557 negro children, or a total of 538,119. The enrollment of white children was 222,073, and of negro children, 98,227. The average daily attendance of white children was 163,722, and of negro children, 72,211. There were 5108 white women teachers and 1140 white men teachers, 975 negro women teachers, and 395 negro men teachers. The average yearly salary of white men teachers was \$711.50, and of white women teachers, \$439.12. The average salary of negro men teachers was \$36 per month, and of negro women teachers, \$30 per month. The net expenditure for educational purposes in 1916 was \$5,701,704.

**FINANCE.** The latest statistics available from the State Treasurer are for the fiscal year 1913. In that year the total receipts were \$8,203,465, and the disbursements, \$7,365,208. At the beginning of the year there was a balance of \$850,025, and at the end, of \$1,062,174.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions of the State include the Institute for Deaf and Dumb at Baton Rouge, Institute for the Blind at Baton Rouge, Soldiers' Home at New Orleans, Insane Asylum at Jackson, Charity Hospital at New Orleans, Charity Hospital at Shreveport, and a State Penitentiary and Convicts' Farm.

**POLITICS AND GOVERNMENT.** The last two campaigns in Louisiana witnessed the extinction of the Progressive party as a party. The Progressives polled less than 10 per cent of the total vote at the election in 1916, which is less than is required to constitute a party. In 1915 the Progressives bade fair to challenge the Democratic supremacy in the State, but on November 7th the party polled fewer votes than the Republican organization. Primaries for the nomination of Governor were held on Jan. 26, 1916. There were two candidates, Attorney-General Pleasant, who had been Lieutenant-Governor of the State, and James Barret, both of Shreveport. The political machine of New Orleans did not place a candidate in the field, although that city normally polls nearly one-third of the vote of the State. In general the support of New Orleans went to Pleasant, because Barret had declared for State-wide prohibition. In the primary held on January 26th, Pleasant was nominated by a vote of 84,407 to 30,112 for Barret. At the State election held in April the Democratic candidates nominated at the primaries were elected.

Before the Democratic primaries the Progressives in convention had nominated for Governor John M. Parker, a wealthy cotton merchant of New Orleans, who ran both as a Progressive and as an "Independent Democrat." The Democratic vote at the primary indicated that Mr. Parker had no chance in the general election, because it was believed that those who took part in the Democratic primaries would abide by the applied pledge to support the ticket

nominated. The opposition to Pleasant, however, declared that these men were not bound, and Mr. Parker agreed that they were not legally bound. During the campaign Mr. Parker developed strength, and his partisans were confident of his election. There were many who refused to be bound by the applied primary pledge, and openly advocated the election of Parker, though admitting they had participated in the Democratic primary. In the election Mr. Parker polled over 40,000 votes, and the Democratic vote fell from the primary figure by 25,000. The result was hailed by the Progressives as the breaking of the dawn of a new party, a confidence that was destined not to survive. When the new Democratic administration came into power it presented to the Legislature both a new primary and a new general election law. The primary law was intended primarily to cover the bolting from the previous primary, and was bitterly fought by the opposition in the Legislature together with some of the Democrats. It was, however, made a caucus measure, and was placed on the statute books. The essential changes from the former law were that the primary nominations were compulsory with all parties, and to require all primaries to be held on the same day. These clauses were bitterly fought but the greatest opposition was to the clause making it a misdemeanor to vote in the primaries of a party to which the voter had not announced his affiliation when he registered, and to a pledge to be printed on the ticket, which would have the voter agree to support the candidate nominated in his primary. The general election law was changed so as to make its essential provisions stronger, and it provided, as had previous election laws, that the parties which failed to poll 10 per cent of the vote cast in a general election, cease to be parties, in the contemplation of the laws of the State. This law did not affect the Republicans, who had no ticket in the field in the April election, but in the presidential election it eliminated all parties in the State except the Democratic.

There was practically no opposition to the Democratic delegates in the presidential election. The only real contest was in the third Congressional district where Whit Martin was the candidate of the Progressives, and Wade Martin of the Democrats. The Progressive candidate had been elected by a majority of 1426, in the previous Congressional election, and it was believed that he would receive a majority in 1916. The result showed that he received only a majority of 99, and Wade Martin announced his intention to contest the election, because of alleged frauds. The vote for Governor in the election in April was as follows: Pleasant, Democrat, 80,801; Parker, Progressive and Independent Democrat, 48,068. For President the vote was: Wilson, 79,875; Hughes, 6466; Parker, Progressive, 6349; Benson, Socialist, 392. The total vote being 93,082, those parties which fell below 9309 lost their identity as such, leaving the Democratic the only party in the State.

**LEGISLATION.** The Legislature met in 1916 and passed many important measures. A record of these follows:

The laws relating to the procedure of criminal cases were amended. Provision was made that a competent witness in any civil or criminal pro-

ceeding must be a person of "proper understanding," that conversations between husband and wife shall be privileged, and that neither husband nor wife shall be compelled to be a witness on the trial of a criminal procedure against the other. A State board of education was created, of which the State Superintendent of Education is a member. Two constitutional amendments were proposed. The keeping or selling of malt liquors whether or not intoxicating or containing alcohol, in municipalities where the sale of intoxicating liquors is prohibited, is forbidden. It is also unlawful to ship or carry any vinous liquors into any portion of the State where the sale of such liquors is prohibited by law or ordinance, except as provided in this act. The business of lending money on wages is regulated. It is made a misdemeanor for an employer or an officer of a corporation knowingly to fail properly to protect machines or to permit defective machinery in any place of employment. The workmen's compensation law was amended in many points. The laws affecting life insurance were amended, as also were the laws relating to banks and banking. A constitutional amendment was proposed requiring railroads and other corporations in the State to maintain a general office within the State. Absolute divorce on proof of continuous living apart for a period of seven years was authorized. It is made a misdemeanor for parents or others having the custody of children under 17 years of age to abuse or neglect them, or to permit them to be abused or neglected. For changes in the election laws, see *Politics and Government* above. See also *LEGISLATION* in 1916.

**STATE OFFICERS.** Governor, R. G. Pleasant; Lieutenant-Governor, Fernand Mouton; Secretary of State, James J. Bailey; Treasurer, Henry Hunsicker; Auditor, Pau Capdeville; Adjutant-General, C. C. McCrory; Attorney-General, A. V. Coco; Superintendent of Education, T. H. Harris; Commissioner of Agriculture, H. D. Wilson; Commissioner of Insurance, the Secretary of State—all Democrats.

**JUDICIARY.** Supreme Court: Chief Justice, F. A. Monroe; Associate Justices, O. O. Provosty, A. D. Land, W. B. Sommerville, Charles A. O'Neill.

**LEGISLATURE.** All Democrats except 5 Progressives in Senate, and 12 in House.

**LOUISIANA STATE UNIVERSITY.** A co-educational State institution at Baton Rouge, La., founded in 1860. In the fall of 1916 there were enrolled in the various departments of the university 825 students. Including the executive force and experiment station workers, the faculty numbered 150. The library has 47,617 volumes. President, Thomas Duckett Boyd.

**LOVELL, SIR FRANCIS HENRY.** A British physician, died Jan. 28, 1916, at Hampstead, London. He was born in 1845. From 1878 to 1901 he was connected with the Colonial service, as medical officer of Mauritius, where he was also a member of the Legislative Council, and as surgeon-general and member of the Executive and Legislative Councils of Trinidad and Tobago. He received the C.M.G. in 1893 and was knighted in 1900. For some years before his death, as dean of the London School of Tropical Medicine, he had done much to further the study of tropical diseases.

**LOW, SETH.** An American educator, publicist, and civic official, died on Sept. 17, 1916,

at his country home, Broad Brook Farm, near Bedford Hills, New York. He was born in Brooklyn, N. Y., on Jan. 18, 1850, and was educated at the Brooklyn Polytechnic Institute and at Columbia University, where he graduated in 1870. Shortly afterward he entered the tea-importing house founded by his father in New York City, was admitted a member of the firm in 1875, and retired in 1888, having acquired a large fortune. In 1878 he organized and became the first president of the Brooklyn Bureau of Charities, one of the first societies to promote coöperation and to prevent waste and fraud in charity service. He became prominent in civil service reform, carrying out his ideas while mayor of Brooklyn in 1882-86, having been twice elected on an independent ticket. In 1890 he was elected president of Columbia University, succeeding Dr. F. A. P. Barnard in that office. Under his skillful administration the university greatly increased in resources, number of students, and general standing. The site was transferred to valuable property on Morningside Heights, where new buildings for special schools were erected, and mainly through his efforts were vitally united into a university. The Low Memorial Library at Columbia, erected by him in honor of his father, Abiel Abbot Low, and architecturally one of the finest buildings in the United States, cost \$1,000,000. In 1897 he was an independent candidate for mayor of Greater New York, but was unsuccessful. He was a member of the American delegation to the peace conference at The Hague in 1899, and in October, 1901, he resigned the presidency of the university and was elected mayor of Greater New York on a fusion ticket. He filled that position from Jan. 1, 1902, to Dec. 31, 1903, having given the city a clean and progressive administration along the lines he had introduced in Brooklyn. In 1903 he was a candidate for reelection, but was defeated by George B. McClellan. From 1881 to 1914 he was a trustee of Columbia. He served at various times as president of the Archaeological Institute of America, the New York Academy of Political Sciences, the American Asiatic Society, the American Geographical Society, the National Civic Federation, and the New York Chamber of Commerce. Honorary degrees were given him by Amherst and Trinity colleges, and by Harvard, Princeton, Yale, Edinburgh, and Columbia universities, by the University of the State of New York, and the University of Pennsylvania. In 1914 President Wilson appointed him one of a commission of three to settle the Colorado coal strike. In 1915 he served as delegate-at-large to the State Constitutional Convention. In 1916, up to the time his illness became acute, he was engaged in the work of conciliation between railway employees and employers, and in the affairs of the National Civic Federation.

**LOWDEN, FRANK O.** Elected Republican Governor of Illinois, Nov. 7, 1916.

**LOWELL, AMY.** See LITERATURE, ENGLISH AND AMERICAN, *Poetry*, American.

**LOWELL, PERCIVAL.** An American astronomer, traveler, and author, died Nov. 13, 1916, at Flagstaff, Ariz. He was a brother of A. Lawrence Lowell, president of Harvard University, and a cousin of the poet, James Russell Lowell, and was born in Boston, March 13, 1855. He was educated at the Boston Latin School

and at Harvard University, where he graduated in 1876. In 1883 he went to Japan, where he lived until 1893. He then returned to the United States, and in 1894 established the Lowell Observatory at Flagstaff, Ariz., but remained closely connected with the Harvard Observatory. In 1894 he was counselor and foreign secretary to the Korean special commission in the United States. In 1902 he was appointed non-resident professor of astronomy at the Massachusetts Institute of Technology, and made discoveries on the planets Mercury, Venus, Saturn, and especially Mars. He supported the theory of Schiaparelli that there are canals on the last-named planet and also living, intelligent beings. For his researches on Mars he received the Janssen medal of the French Astronomical Society in 1904, and in 1908 a gold medal from the Sociedad Astronomica of Mexico. In 1910 Dr. Lowell maintained his views about Mars in his lectures before the Royal Institute in London and the Association Astronomique in Paris. His arguments aroused considerable opposition, but were accepted by some astronomers. He was a member of several learned societies and received honorary degrees from many universities. His publications include: *Choson* (1885), a sketch of Korea; *The Soul of the Far East* (1886); *Nota, an Unexplored Corner of Japan* (1891); *Occult Japan, or the Way of the Gods* (1895); *Mars* (1895); *Annals of the Lowell Observatory*, vol. i, 1898, vol. ii, 1900, vol. iii, 1905; *The Solar System* (1903); *Mars and Its Canals* (1906); *Mars as the Abode of Life* (1908); *The Evolution of Worlds* (1909). See ASTRONOMY.

**LOWTHER, SIR GERARD AUGUSTUS.** A British diplomat, died at Sandwich, April 5, 1916. A nephew of the third Earl of Lonsdale and grandson of Lord Wensleydale, Sir Gerard Lowther was born in 1858. He was educated at Harrow, and entered the diplomatic service at 21. After being connected with legations and embassies for some years, he received his first major appointment, as minister to Chile in 1901. Three years later he was transferred to Tangier, as minister and consul-general, and from 1908 to 1913 was ambassador at Constantinople. He was made a privy councillor in 1908, a G.C.M.G. in 1911, and a baronet in 1914. His wife, the daughter of Atherton Blight of Philadelphia, became known for her work in behalf of Turkish refugees while in Constantinople. Lowther himself had a difficult situation to face in Turkey, because of the uncertainty of the British attitude toward the Young Turk activities and German influence.

**LOYOLA UNIVERSITY.** A Roman Catholic institution in Chicago, Ill. As St. Ignatius's College, it was founded in 1870. The corporate name was changed in 1909. It is co-educational in its graduate departments. In the fall of 1916 the enrollment was as follows: Arts 121, sociology 260, medicine 292, law 118, pharmacy 61, and engineering 38. The faculty numbered 147. There were no important changes in the faculty, or large gifts during the year. The library contains 50,000 volumes. President, John Baptist Furay.

**LUBLINITE.** See MINERALOGY.

**LUCAS, E. V.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, English; *Essays*, English.

**LUCCOCK, NAPHTALI.** An American Methodist Episcopal bishop, died at Lacrosse, Wis., April 1, 1916. He was born at Kimbolton, Ohio, in 1863, and after graduating from Ohio Wesleyan University in 1874, received higher degrees there and at the University of Western Pennsylvania (University of Pittsburgh). Meanwhile he had been ordained and for three years had served as professor in Allegheny College. Syracuse University gave him the degree of D.D. in 1886. Later he became minister of the Union Methodist Episcopal Church in St. Louis, and at the time when he was elected bishop (1912) occupied the pulpit of the Hyde Park Church in Kansas City, Mo. Bishop Luccock was stationed at Helena, Mont., and died on his way to New York City. He was the author of sermons published as *The Royalty of Jesus* (1906), and, with others, of an *Illustrated History of Methodism* (1901).

**LUNACY.** See **INSANITY.**

**LUNGMOLE.** See **RESUSCITATION.**

**LUTHER, MARTIN.** See **GERMAN LITERATURE, New Editions.**

**LUTHERANS.** The Lutheran Church is the third largest denomination in the United States, where it had, in 1916, 3,774,774 baptized members (including Canadian members), 2,445,276 confirmed members or communicants, 15,069 churches, 9831 ministers. In Canada, according to the latest available statistics, there were 229,864 communicants, 133 ministers, and about the same number of churches. In Canada the Lutheran church conducts services in 13 different languages. The value of Lutheran church property in the United States and Canada in 1916 was \$102,320,045. No form of church government is held to be essential, and the services and organization are carried on under Congregational, Presbyterian, and Episcopal forms. There are five general church bodies: the General Council, founded 1867; General Synod, founded 1820; Synodical Conference, founded 1872; United Synod South, founded 1886; United Norwegians; also a number of independent synods.

**GENERAL COUNCIL.** The General Council in the United States in 1916 had 517,931 confirmed members or communicants, 2606 churches, 1753 ministers.

**GENERAL SYNOD.** In 1916 there were 360,749 communicants, 1847 churches, and 1425 ministers.

**SYNODICAL CONFERENCE.** There were in 1916 827,056 communicants, 3901 churches, and 3268 ministers.

**UNITED SYNOD SOUTH.** There were in 1916 72,462 communicants, 494 churches, and 261 ministers.

**UNITED NORWEGIAN.** In 1916 there were 173,534 communicants, 1650 churches, and 650 ministers.

**INDEPENDENT SYNODS.** There were in 1916, excluding the United Norwegian, 511,344 communicants, 4571 churches, and 2474 ministers.

For 1916 the Lutherans reported a gain of 11,092 members. There are 14 American societies of foreign missions, with 323 missionaries, 1722 native helpers, 87,885 native Christians, 28,950 pupils in mission schools, and an income of about \$560,000. On account of the European war no data for 1915-16 are available concerning the 35 European societies engaged in foreign missions. The work of for-

eign societies is much interrupted, many missionaries being seized and held as prisoners of war. The Lutherans have 29 theological seminaries, 41 colleges, and 60 academies, and 9 ladies' colleges and seminaries.

Among the synods of the general council in 1916, that of Pennsylvania revised its constitution and established a salaried presidency, the president being elected for a term of five years and eligible for reelection. Of the \$500,000 educational fund \$334,885 was raised at the time of the convention in New York. The ministerium decided to signalize the 400th anniversary of the Reformation by raising \$100,000 for the Jubilee Fund, all of which will go to educational uses. The Pittsburgh synod raised \$50,000 for the Home for the Aged at Zelienople. The synod of Canada had no convention in 1916 on account of the war; all the other Canadian synods were hindered in their work for the same reason.

**LUXEMBURG.** An independent, neutral grand duchy, bordering Belgium, Germany, and France. The area is 2586 square kilometers (998 square miles). Population (Dec. 1, 1910), 259,891 (134,101 males, 125,790 females). Roman Catholics numbered 250,543, Protestants, 4007, and Jews, 1270. Natives of the grand duchy numbered 220,168; there were 21,762 Germans, 10,138 Italians, 3964 Belgians, and 2103 French. Luxembourg, the capital, had 20,848 inhabitants. Iron mining is an important industry; production 1914, 1,827,270 metric tons. The grand duchy is included in the German customs union. Railways (1913), 325 miles; telegraphs, 439 miles, with 1352 of wire; post offices, 140. The budget for 1916-17 showed estimated revenue of 17,492,305 francs and estimated expenditure of 23,334,661 francs. Customs and direct taxes each supply about one-fourth of the revenue. The debt amounts to 12,000,000 francs; annuities, 493,150 francs. The amount paid by Germany after the invasion on Aug. 2, 1914, is estimated at \$250,000. The chamber of deputies consists of 53 members, elected for six years by direct vote. The grand duke, William, died Feb. 25, 1912, and was succeeded by his daughter, Marie Adelaide (born June 14, 1894), who was enthroned on attaining her majority, June 14, 1912. Her sister, Princess Charlotte (born 1896), is heir-ess-presumptive.

The serious difficulties with the government that had arisen in 1915 continued. The minister of state, Dr. Lautsch, had dissolved the Diet November 12th. Upon its reassembling in January, it again showed its discontent, going so far as to break out into disorder and throw chairs out of the window. It voted no confidence by a vote of 26 to 25, whereupon Dr. Lautsch resigned and the Grand Duchess Marie called ex-Premier Vannerus on January 28th to form a ministry. He, however, fell from power on February 21st, and finally a Catholic Liberal Socialist Coalition succeeded in forming a cabinet under M. Thorn, which received a vote of confidence of 39 to 1.

**LYAUTEY, HUBERT.** See **FRANCE.**

**LYMAN, FRANCIS MARION.** An American Mormon official, president of the Quorum of the Twelve Apostles in the Mormon Church, and next in succession to President Joseph F. Smith, died at Salt Lake City, Utah, Nov. 18, 1916. He was born in 1840, in Goodhope, McDonough

County, Ill., went with his father in 1851 to San Bernardino, Cal., then an outfitting point for Latter Day Saints, and received his early education there. In 1860 he was ordained one of the Seventy Elders of the Mormon Church, later settled in Utah, went to England as a missionary in 1862, and returned with over 800 converts. After holding various civic and administrative positions in Utah and serving in the State Legislature, being at the same time engaged in the flour and grain trade and other business enterprises, he was elected one of the Twelve Apostles in 1880, and afterward devoted himself wholly to church work, except for a short term in the State Legislature. He made a second missionary trip to England in 1873, and a third more extended foreign trip in various countries in 1901-04, being chosen president of the Council of the Twelve Apostles during his absence in 1903. Lyman's testimony at the Reed Smoot hearing before the United States Senate Committee on Privileges and Elections made a sensation. He then confessed his own polygamy, and asserted the polygamy of President Joseph F. Smith, and of the Mormon apostles in direct succession. He said that he knew he was living in disobedience to the law of the land and expected so to live. Under severe cross-examination his evidence was shown to be contradictory, but although he was placed in an unfavorable light before the public his standing in the Mormon Church was not seriously affected.

**LYNCHINGS.** Statistics were published at the close of the year by the Tuskegee Institute of Alabama showing the number of lynchings during the year 1916. According to this, the total was 54, of whom all but 4 were negroes; 47 men and 3 women. The largest number of lynchings occurred in Georgia, 14; next came Florida with 8, and Arkansas and Oklahoma, 4 each.

**MABLE, HAMILTON WRIGHT.** An American essayist, editor, critic, and lecturer, died Dec. 31, 1916, at Summit, N. J. He was born at Cold Spring, N. Y., on Dec. 13, 1846, graduated from Williams College in 1867 and from the Law School of Columbia University in 1869. In 1879 he joined the editorial staff of the *Christian Union*, afterward called the *Outlook*, of which he became associate editor. He received honorary degrees from his alma mater, from Union College, from Western Reserve, and from Washington and Lee University, and became a member of the American Academy of Arts and Letters. His writings, with one or two exceptions, are essays and familiar talks on literature, nature, and the spiritual life, and are distinguished by breadth of view, felicitous language, and a high moral and religious tone. In 1913 he went to Japan on a peace mission under the auspices of the Carnegie Foundation for Peace, and made many speeches that were successful to a considerable extent in allaying the anti-American feeling then prevalent in certain parts of Japan. His publications include: *Norse Stories, Retold from the Eddas* (1882); *Nature in New England* (1890); *My Study Fire* (two series, 1890 and 1894); *Essays in Literary Interpretation* (1892); *Essays on Books and Culture* (1897); *Essays on Work and Culture* (1898); *The Life of the Spirit* (1899); *William Shakespeare, Poet, Dramatist, and Man* (1900); *Parables of Life* (1902); *Essays on Nature and*

*Culture* (1904); *Introductions to Notable Poems* (1909); *American Ideals, Character, and Life* (1913); and *Japan To-day and To-morrow* (1914).

**MACAO.** A Portuguese dependency, consisting of the island of Macao and two islets at the mouth of the Canton River, China. Area, 4 square miles. Population (1910 census), 74,866; Chinese numbered 60,057; whites, 3019, of whom Portuguese, 3780. The port and city of Macao are important in transit trade with south China.

**MCCABE, JOSEPH.** See LITERATURE, ENGLISH AND AMERICAN, *History and Essays*, English.

**MCCALL, SAMUEL W.** Re-elected Republican Governor of Massachusetts Nov. 7, 1916. See MASSACHUSETTS; also LITERATURE, ENGLISH AND AMERICAN, *History, etc.*, American.

**MCCCLINTOCK, EMORY.** An American insurance official, died at Bay Head, N. J., July 10, 1916. He was born in Carlisle, Pa., in 1840, and after graduating from Columbia University in 1859, served for a short time as tutor, and in 1863 was appointed United States consular agent at Bradford, England. Returning to New York, he was actuary of the Ashbury Life Insurance Company from 1867 to 1871, and afterward actuary of the Northwestern Mutual Life till 1889. In that year he became connected with the Mutual Life of New York, of which he was vice-president and trustee in 1905-11, and consulting actuary and trustee thereafter. Mr. McClintock served as president of the American Mathematical Society from 1890 to 1894, and as president of the Actuarial Society of America from 1895 to 1897. The American Academy of Arts and Sciences elected him one of its honorary fellows, and the Institute of Actuaries, London, a fellow. Honorary degrees came to him from Wisconsin, Columbia, and Yale universities.

**MCCORMICK, VANCE CRISWELL.** See UNITED STATES, *Presidential Campaign*.

**MCCUMBEE, PORTER JAMES.** Re-elected Republican United States Senator from North Dakota Nov. 7, 1916.

**MCCURDY, RICHARD ALDRICH.** An American insurance official, died at Morristown, N. J., March 6, 1916. He was born in New York Jan. 29, 1835, son of Robert H. McCurdy, a director of the Mutual Life Insurance Company. Richard A. McCurdy, having graduated in law from Harvard in 1856, formed a partnership with Lucius Robinson, who was afterward Governor of New York, and early became prominent in civic affairs. In 1860 he was appointed counsel for the Mutual Life, and in 1865 was elected vice-president. From 1885 till his resignation in 1906 he was its president, and as such became known as one of the three biggest figures in insurance in the United States, the others being Henry B. Hyde of the Equitable and John A. McCall of the New York Life. Popularly he was supposed to be more powerful than either of these. It had been known that he lived in great luxury, but it was not until the Armstrong investigation of 1905, conducted by Charles E. Hughes, that the public learned details. It appeared that Mr. McCurdy had been given a salary of \$30,000 when he was chosen president of the Mutual, that later this was raised to \$100,000, and finally to \$150,000. He stated on the witness stand that he had never sought an increase and had accepted it simply

as recognition of his services. It was brought out that his son, Robert H. McCurdy, and a son-in-law, Louis A. Thébaud, also received very large incomes from the Mutual, in salaries and commissions. The three built palatial residences in Morristown, the elder Mr. McCurdy's costing, it was estimated, \$1,000,000. Counting in the provision made for other relatives, the total annual remuneration for the family was reckoned to be about \$529,800. The president's power in the Mutual was virtually autocratic. His offices were fitted up as none had ever been before, adorned with costly woods, marble, and works of art.

On the stand Mr. McCurdy appeared indignant that inquiry should be made into what he considered his private affairs. He said he knew nothing whatever about the profits of the company, that it was run as a great benevolent institution, without regard to profits. It was a fact, however, that the Mutual had grown to the point where its assets nearly equaled the combined assets of the Bank of England, the Bank of France, and the Bank of Germany. When informed of policy-holders' complaints regarding shrinkage in dividends, Mr. McCurdy proved to be equally unfamiliar with that side of the business. Nor did he profess to know anything about the relations of his company with politics. The investigation brought out the existence of legislative agents of the Mutual at Albany who maintained what was known as the "House of Mirth" for the assistance of legislators whose help was needed at the capitol. In political contributions tens of thousands of dollars were spent annually. At the close of the investigation, Mr. McCurdy asked to have his salary reduced to \$75,000, and shortly afterward he resigned. His relatives also severed their connection with the company. The Mutual Life brought suits against the former president and other officers to recover \$8,000,000 said to have been improperly taken or expended from the funds of the company. These claims were settled for \$815,000. Broken in health by the ordeal, Mr. McCurdy made a long sojourn abroad and afterward lived quietly in Morristown.

**McCUTCHEON, GEORGE BARR.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction, American.*

**MACEDONIA.** Anciently a country north of Thessaly on the northwest shore of the Ægean Sea. This region has no definite political boundaries, but corresponds nearly to the modern Turkish vilayet of Saloniki and the eastern part of the vilayet of Monastir; it came to be commonly termed Macedonia in the nineteenth century, when it was often prominent as the scene of racial strife, especially that of the various nationalities settled there (Bulgar, Serb, Greek, etc.) with the dominating Turk. The Ottomanization of the country, more vigorously prosecuted after the Turkish revolution of 1908, provoked in 1912 the coalition of Bulgaria, Serbia, Montenegro, and Greece against Turkey; the latter, defeated in the first Balkan War, of 1912-13, ceded most of her European dominions to the victorious Christian powers. Macedonia was partitioned in 1913 among Greece, Serbia, and Bulgaria, the greater part being taken by Greece. See WAR OF THE NATIONS.

**McFEE, WILLIAM.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction, English.*

**MacGILL, PATRICK.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction, English.*

**McGILL UNIVERSITY.** A Canadian educational institution at Montreal. It was founded in 1821 and reorganized in 1852. The enrollment has been greatly reduced by the European war. In the fall of 1916 there were 1052 students and 254 faculty members, divided among the faculties of arts, medicine, law, applied science, and agriculture. During the year Dr. James Douglas gave \$150,000 for the erection of students' residences. Sir W. C. Macdonald gave \$26,000 for the construction of a filtration plant at Macdonald College, affiliated with the university. By legacy \$20,000 was received from Guy M. Drummond. The productive funds of the institution amount to \$8,682,119, and the income from all sources in 1916 was \$770,938. In the university library are 154,000 volumes and in the medical library 40,000 volumes. Principal, Sir William Peterson.

**MACH, ERNST VON.** An Austrian physicist and psychologist, died in Vienna Feb. 19, 1916. He was born at Turas, Moravia, Feb. 18, 1838, was educated at Vienna, and was professor successively at Graz, Prague (where he was rector magnificus in 1879-80), and Vienna, where he remained for six years (1895-1901). Upon his retirement he was appointed member of the Austrian House of Peers. Mach devoted himself to pure physics, to the history and philosophy of this subject, and to the relation of physics to psychology, and in these fields, particularly the last named, he made notable contributions. He was probably the leading philosophical scientist of his time. The work published in 1886 and translated into English as *The Analysis of Sensations and the Relation of the Physical to the Psychical* attracted wide attention. Other of his important writings that have appeared in English are: *The Science of Mechanics* (with supplementary volume); *Popular Scientific Lectures*; *Space and Geometry in the Light of Physiological, Psychological, and Physical Inquiry*; *The History and the Root of the Principle of the Conservation of Energy*. The publishers have announced the following as in course of preparation: *Civilization and Mechanics*; *Theory of Heat*; and *Cognition and Error*.

**MACHINE GUNS.** See MILITARY PROGRESS.

**MACKAY, JOHN HENRY.** See GERMAN LITERATURE, *Miscellaneous.*

**MACKAYE, PERCY.** See DRAMA; LITERATURE, ENGLISH AND AMERICAN, *Poetry, American.*

**McKELLAR, KENNETH DOUGLAS.** Elected Democratic United States Senator from Tennessee Nov. 7, 1916.

**MACKENSEN, AUGUST VON.** See WAR OF THE NATIONS.

**McKINLEY, WILLIAM.** See LITERATURE, ENGLISH AND AMERICAN, *History, etc., American.*

**McLEAN, EMILY NELSON RITCHIE** (Mrs. Donald McLean). An ex-president-general, and at her death, honorary president-general, of the Daughters of the American Revolution, died in Baltimore, Md., May 19, 1916. The daughter of Judge John Ritchie of Frederick, Md., she was born in 1859, graduated from Frederick Seminary in 1873, and later specialized in languages, history, and mathematics. She was married to Donald McLean, a lawyer of New York,

in 1883. and her home was thereafter in that city. Mrs. McLean was a charter member of the D. A. R., and for 10 years was regent of the New York Chapter, before 1905, when she was elected president of the national organization, succeeding Mrs. Charles Warren Fairbanks. Previously, the holder of this office had always been the wife of some government official. Mrs. McLean became noted for her remarkable executive ability, and in addition she traveled much, lecturing on patriotic and educational subjects. In her honor a scholarship was established at Barnard College, and a lecture course at the Memorial Continental Hall, in Washington. She was a member of the Colonial Dames, and of other organizations.

**McLEAN, GEORGE PAYNE.** Reflected Republican United States Senator from Connecticut Nov. 7, 1916.

**McLEAN, JOHN ROLL.** An American newspaper owner, died at his suburban home at Friendship, near Washington, June 9, 1916. He was born in 1848 in Cincinnati, Ohio, studied there and at Harvard, and returned to identify himself with his father's paper, the Cincinnati *Enquirer*, on which he was first office boy and later police reporter. His father sold him a half interest in 1872, and in 1881 he became sole owner. Mr. McLean early became prominent in Democratic politics, and he had been a delegate at large to the national conventions of his party since 1884. At various times he had been a candidate for Governor of Ohio, United States Senator, and for the Democratic presidential nomination. For a while he owned the New York *Evening Journal*, which he sold to William Randolph Hearst. The Washington *Post* he bought in 1905; this had since been one of his chief interests. His fortune, estimated at upwards of \$100,000,000, was made largely in real estate and in public service corporations. He owned much land in Cincinnati, as well as Western mining property, and for many years was president of the Washington Gas Light Company, owned a large hotel in Washington, and was a large stockholder in the Capital Traction Company.

**MacMILLAN, DONALD B.** See POLAR RESEARCH, *Arctic*.

**MADAGASCAR.** A great island in the Indian Ocean, off the east coast of Africa; a French colony, covering 585,300 square kilometers (225,984 square miles) and having a population (1914) of 3,253,581 (with dependencies, 3,293,552). Antananarivo (Tananarive) is the capital, with 72,000 inhabitants; Fianarantsoa has about 7000; Tamatave, 7026; Majunza, 4600. Madagascar is divided for administrative purposes into 19 provinces, 3 circles, and 1 autonomous district. The Hova is the dominant tribe. Agriculture is the leading industry and rice the staple native crop. Cattle-raising is important. The Europeans resident in the colony cultivate coffee, tobacco, sugar-cane, hemp, cotton, vanilla, tea, etc. The forest products are valuable. Sericulture is carried on. The mines yield gold, silver, iron, copper, lead, and zinc. Native manufactures include silk and cotton goods and fabrics. Trade and finance statistics are given below in francs:

	1910	1911	1912
Imports	84,595,000	46,057,000	46,747,456
Exports	47,883,000	52,378,000	56,054,377
Budget	30,750,000	31,153,000	.....

The trade for 1914 is reported from a British source at £1,894,266 imports and £1,857,330 exports; the 1914 budget balanced at £1,440,717 and the 1915 budget at £1,507,839.

Tonnage entered in the 1914 trade, 1,910,142. Of railways, there are 368 kilometers. A railway connects Brickaville with the capital, with an extension from Brickaville to Tamatave. The Antananarivo-Tamatave line was completed early in 1913. Telegraph lines 7192 kilometers, wires 12,297; telephone lines, 1381 kilometers; post offices, 171. The colony is administered by a governor-general.

**MAGNESIUM.** See CHEMISTRY, INDUSTRIAL.

**MAGNETIC SURVEYS.** See EXPLORATION.

**MAGNETISM, THEORIES OF.** See PHYSICS.

**MAHLER, GUSTAV.** See MUSIC, *Novelties*.

**MAIL.** See UNITED STATES, *Post Office*.

**MAIL BY AIRPLANE.** See AERONAUTICS.

**MAILS, SEARCH OF.** See CONTRABAND OF WAR.

**MAINE. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 774,914. The population in 1910 was 742,371.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn	15,000	645,000	\$768,000
1915	16,000	658,000	558,000
Wheat	5,000	135,000	252,000
1915	4,000	112,000	125,000
Oats	170,000	6,120,000	4,100,000
1915	175,000	7,000,000	3,150,000
Potatoes	125,000	25,500,000	86,210,000
1915	142,000	25,418,000	17,793,000
Hay	1,200,000	1,740,000	21,576,000
1915	1,150,000	1,322,000	19,695,000
Barley	6,000	156,000	162,000
1915	5,000	132,000	99,000
Buckwheat	14,000	386,000	319,000
1915	13,000	338,000	237,000

c Tons.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments	3,546	3,378
Average number of wage earners	79,955	82,149
Capital invested	\$202,260,000	\$238,844,000
Wages	87,632,000	43,254,000
The value of materials used	97,101,000	117,655,000
The value of products	176,029,000	200,450,000

**TRANSPORTATION.** The total railway mileage of the State on June 30, 1916, was 2289. The railroads having the longest mileage are the Maine Central, 1007, the Bangor and Aroostook, 631, and the Canadian Pacific, 177. There was no construction of track during the year.

**EDUCATION.** The school population of the State on April 1, 1915, was 225,013. The registration in the schools was 113,036. The total number of teachers was 6273. The average salary of male teachers per month was \$53.04, and of female teachers \$10.77 per week. The total school revenue from local taxation and from State school funds was \$2,098,355.

**FINANCE.** The report of the State Treasurer



for the fiscal year 1916 shows a balance on Jan. 1, 1916, of \$1,158,938. The receipts from all sources during the year were \$6,865,855, and the disbursements \$6,551,676, leaving a balance on Dec. 31, 1916, of \$1,473,118. This is the largest cash balance ever recorded in the department at the close of any fiscal year. The amount represents nearly three mills on the State valuation, and is equal to more than one-half of the State tax assessed in any one year in the history of the State. On Jan. 1, 1916, the bonded debt was \$1,522,000. An issue of \$500,000 in 20 year State highway bonds was sold on March 1, 1916.

**CHARITIES AND CORRECTIONS.** The charitable institutions include State Hospitals at Augusta and Bangor, the Maine School for Feeble-Minded, and the Bath Military and Naval Asylum at Bath. The correctional institutions include the Maine Industrial School for Girls at Hallowell, the State School for Boys at South Portland, and the Maine State Prison at Thomaston. The total expenditures for the maintenance of these institutions is about \$1,000,000 per year.

**POLITICS AND GOVERNMENT.** The year 1916 in Maine opened with a Democratic State government. Early in the year, under the direction of the chairman of the Republican State committee, meetings were held successively in each county in the State, at which Progressive leaders were induced to advocate concessions tending to a practical reunion of the parties. These were called "get-together meetings." Under the influence of these, amalgamation had progressed so far that by March 23, 1916, when the State Republican Convention was held at Portland, the Republican platform included the leading policies of both the Republican and Progressive parties with special emphasis on the Republican national platform of 1908. It was found to be so satisfactory to both elements that it was enthusiastically accepted in a public mass meeting on the night preceding the opening of the convention, and by this meeting was recommended to the convention for its adoption.

Hon. William T. Cobb, ex-Governor of Maine, presided at the convention, which was held in Portland City Hall, and the principal address was by United States Senator William Alden Smith of Michigan. Delegates to the national convention, over the choice of which it had been feared there would be a party split, were named by acclamation and were uninstructed by the convention. It was the general understanding that they were to go as free-agents, and that if a union be reached in favor of ex-Governor Hughes, it would be satisfactory. To indicate how true this understanding was it may be said that the delegates to the national Republican convention in Chicago cast votes for Hughes, Roosevelt, Weeks, and Root, dividing on all the ballots until the last, when they voted solidly for Hughes.

The Democratic State convention was held in Bangor, March 29th, and its delegates were instructed for President Wilson.

The primary elections were held June 19th. There were no contests of importance in the Democratic primaries, five candidates for Governor, four for United States Senator, and a multitude of candidates for minor offices filed papers in the Republican primaries and kept the State in political turmoil up to the date of the primaries, resulting in the nomination for

Governor of Carl E. Milliken by a plurality of over 8000 votes over his nearest competitor, Frederick H. Parkhurst of Bangor, and the nomination for United States Senator of Frederick Hale of Portland, who led ex-Governor Fernald of Poland by 1500 votes, and Ira G. Hersey of Houlton by 3500, with a total vote of rising 45,000. The Democrats nominated Oakley C. Curtis of Portland for Governor, and re-nominated Charles F. Johnson of Waterville for United States Senator. The Republicans nominated Louis B. Goodall of Sanford for Congressman from the first district, Wallace H. White, Jr., of Lewiston, second district, John A. Peters of Ellsworth, third district, and Frank E. Guernsey of Dover, fourth district. The Democrats nominated John Clarke Scates of Westbrook for Congress from the first district, Daniel J. McGillicuddy of Lewiston, second district, John E. Bunker of Bar Harbor, third district, and Leonard A. Pierce of Houlton, fourth district.

The death of United States Senator Edwin C. Burleigh at Washington June 16th, two years before the expiration of his term of office, occasioned an extra primary election to nominate candidates to be voted for in September to fill Senator Burleigh's unexpired term. The Republican candidates were ex-Gov. Bert M. Fernald and Ira G. Hersey. Before the filing of papers Mr. Hersey withdrew and Congressman Frank E. Guernsey of Dover, resigning his candidacy for Congress in the fourth district, became a candidate for the Senate. The Democrats nominated Kenneth C. M. Sills of Brunswick, without opposition, and in the special primary of July ex-Governor Fernald won the nomination over Congressman Guernsey by a plurality of 632 votes in a total of 18,000 in the Republican primaries and 4500 in the Democratic. Later, in convention at Bangor, Ira G. Hersey of Houlton was nominated for Congress by the Republicans to fill the vacancy on the ticket caused by the resignation of Congressman Guernsey.

The gubernatorial elections were held on September 9th. The preliminary campaign was the most exciting known in Maine for many years. Governor Hughes, Republican candidate for President, toured the State, and at Lewiston made his first aggressive speech on labor legislation; Colonel Roosevelt made a speech at Lewiston which attracted crowds from every section of Maine. The chief contest was over the two United States Senators and four Congressmen, especially the Congressman from the second district, then represented by Mr. McGillicuddy, Democrat. State issues were but little discussed. The speaking bureau of the Democratic and Republican national campaign committees sent to Maine the most brilliant orators of the nation. The result was a victory for the Republicans on both State and national tickets. Carl E. Milliken of Island Falls was elected Governor by over 13,000 plurality. Frederick Hale of Portland (Rep.) was elected to the United States Senate for the long term, defeating Charles F. Johnson (Dem.), candidate for reelection, and ex-Gov. Bert M. Fernald (Rep.) was elected to fill the unexpired term of Senator Burleigh, the pluralities in both cases being approximately 13,000. All four Republican Congressmen were elected, W. H. White, Jr., defeating Congressman McGillicuddy in the second district by a majority of over 750. The Republican House and Senate were elected for the

State and with but few exceptions the Republican county tickets were elected.

No campaign was made for presidential electors. The vote of Maine in November was: Hughes and Fairbanks 69,506; Wilson and Marshall 64,118; Benson and Kirkpatrick (Soc.) 2186; Hanly and Landreth (Pro.) 595; Republican plurality 5388. The official vote of Maine in September for Governor was Carl E. Milliken (Rep.) 81,317; Oakley C. Curtis (Dem.) 67,719; Frank H. Maxwell (Soc.) 1538; Linus Seeley (Pro.) 249.

**LEGISLATION.** A special session of the Maine Legislature was held September 29th-October 3rd, at which the report of the committee on revision of the statutes of Maine was enacted into law, and four bills of minor importance were enacted.

On October 10th five officers of the Aroostook County Potato Shippers Association were found guilty under the Sherman Act in a conspiracy in restraint of trade. Evidence introduced by the government during the trial showed that the defendants had blacklisted dealers in potatoes who failed to conduct their business in accordance with the wishes of the association. The defendants claimed immunity under the Clayton Amendment to the Sherman Anti-Trust Law, on the ground that the organization was an agricultural organization, and exempt from prosecution.

The first national park east of the Mississippi River comprising 5000 acres was created on Mountain Desert Island in July. The tract is known as Sieur de Montes National Monument. The land was donated to the Federal government. Its northern boundary is about a mile from Bar Harbor and there are several popular summer resorts near by. Within the park are ten mountain peaks and four lakes.

**STATE OFFICERS.** Governor, Carl E. Milliken; Secretary of State, John E. Bunker; Treasurer, Elmer E. Newbert; Adjutant-General, George McL. Presson; Auditor, Roy L. Wardwell; Attorney General, William R. Patangall; Superintendent of Public Schools, Glen Starkey; Insurance Commissioner, Erastus J. Carter; Commissioner of Agriculture, W. T. Guptill—all Democrats except Milliken and Wardwell, Republicans. Election Jan. 4, 1917, except for Governor, Auditor, and Superintendent of Public Schools.

**JUDICIARY.** Supreme Judicial Court: Chief Justice, Albert R. Savage; Associate Justices, L. C. Cornish, G. E. Bird, A. W. King, George F. Haley, George M. Hanson, Warren C. Philbrook; Clerk, C. W. Jones.

STATE LEGISLATURE.

	Senate	House	Joint Ballot
Republicans .....	28	105	133
Democrats .....	3	46	49
Republican majority ..	25	59	84

**MAINE, UNIVERSITY OF.** A State co-educational institution, founded at Orono, Me., in 1862. In the fall of 1916 the total enrollment was 1272 and the faculty numbered 155. In 1916 a department of music was established with Adelbert W. Sprague, of Bangor, at its head. Professor Sprague will also act as instrumental and choral conductor and coach. Dr. Ralph Harper McKee, head of the department of chem-

istry, resigned and was succeeded by Dr. Charles W. Easley. The productive funds of the institution amount to \$200,000 and the total income for 1916 from all sources was \$357,540. The library contains 60,000 volumes. President, Robert Judson Alely.

**MAINE FESTIVAL.** See MUSIC, *Festivals.*

**MAIZE.** See CORN.

**MALACCA.** One of the Straits Settlements (q.v.), in the southern part of the Malay Peninsula.

**MALARIA.** R. Ross has attempted to estimate the infectivity of the mosquito in malaria, and concludes that approximately one out of 24 anophelines manages to bite a human being, and that this proportion is greatly reduced as to infectivity since less than 25 per cent succeeded in transmitting the plasmodium. Roughly it may be considered that one out of every 100 female anophelines in a malarial country is a possible carrier of the disease. The United State Public Health Service has recently conducted a series of experiments on human subjects, an account of which is found in Public Health Reports, 1916, xxxi, 2325. These tests show that even short exposure to bites, where mosquitoes are interrupted in their feeding, is sufficient for the successful transmission of the disease. In 17 experiments in which human beings were employed to test the infectibility of *Anopheles punctipennis* with *Plasmodium vivax*, 14 cases of malarial fever resulted. In an attempt to infect several persons with a single insect, one mosquito proved to be the sole infective agent in one experiment, and one proved to be the sole infective agent in three tests.

There is no evidence that the mosquito is in any way harmed by the malarial parasite it harbors; but the ability of an infected insect to strike repeated blows before its power to transmit malaria has been lost can scarcely be doubted. As proved by Ross in 1898 (see YEAR BOOK, 1898) the spores of the malarial plasmodium are concentrated in the salivary gland of the mosquito.

Salvarsan as a cure for chronic and severe forms of malarial infection which are unresponsive to quinine has been used by various observers ever since its discovery, the arsenobenzol preparation being germicidal to the protozoa of malaria as well as to the spirochete of syphilis and other organisms of the same class. Neff of Kansas City reports a series of five cases in children treated with diarsenol (the Canadian preparation resembling salvarsan), with entire success, except that the spleen did not entirely return to its normal size. The peripheral blood was promptly freed from the malarial parasite and ordinary clinical symptoms disappeared. Neff points out that there is a necessity for a remedy which will destroy strains of malarial organisms that are "quinine fast," i.e. resistant to the drug; and in spite of the fact that it is relatively difficult to administer and the dose very often needs to be repeated, salvarsan brings about a rapid cessation of symptoms, sterilization of the blood, and a marked gain in weight and health.

In India a new drug, quinoidin, is being used in large quantities in the treatment of malaria. It is said to be effective, cheap, and an excellent prophylactic. It is valuable both in acute and chronic cases and should be given only after a

thorough purgation. The average dose is four grains twice a day. According to E. E. Waters (Communication to the *Indian Gazette*, Calcutta, September, 1916), quininoidin, properly administered, is at least as effective as quinine and causes no cinchonism or gastric disturbances.

**MALAY STATES.** See FEDERATED MALAY STATES; JOHORE; TRENGGANU.

**MALET, LUCAS.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, English.

**MALTA.** A British crown colony, composed of the Island of Malta (91.5 square miles) in the Mediterranean Sea with the islands of Goza (25.8 square miles), Comino (1 square mile), and Filfa and Cominotto (mere islets). Total civil population (estimate March 31, 1915), 218,542. Valletta, the capital, had, April 2, 1911, 44,143 inhabitants, including suburbs (Floriana, Sliema, and St. Julien's); the Three Cities (Senglea, Cospicua, and Vittoriosa), 26,551; Città Vecchia (the old capital), 8896; Victoria (formerly Rabat), 5655. Valletta is a coaling station and the centre of a large transit trade. The Maltese are remarkably thrifty and industrious; they are good seamen and excellent mechanics. There are 7.75 miles of railway. Imports and exports (1914-15), £2,790,310 and £687,849 respectively. Total weight of goods transhipped (1914-15), 4469 tons. Revenue (1914-15), £410,725; expenditure, £386,283. Tonnage entered and cleared, 7,705,015 (British, 4,714,011).

**MAMMALS.** See ZOOLOGY, *Mammals*.

**MAN, PREHISTORIC.** See GEOLOGY.

**MANCHURIA.** A dependency of China. It is situated east of Mongolia and the Province of Chili, and extends northward from the Yellow Sea and Korea to the Amur River, which separates it from Siberia. The area is estimated at 362,483 square miles. Estimates of population vary widely. The figure derived from the 1910 enumeration of households is 12,742,360, but this does not include children under six years of age; the number of such children has been estimated at about 362,000, so that the total population in 1910 may be placed at about 13,104,000. Manchuria consists of three provinces: at the north, Heilungkiang, with an estimated area of 202,703 square miles and an estimated 1910 population of 1,607,000; Kirin, 105,019 square miles, 5,501,000 inhabitants; Shengking, at the south, 54,761 square miles, 5,996,000 inhabitants. The city of Mukden is the administrative headquarters of Manchuria and also the capital of the Province of Shengking; its population is estimated at about 158,000. The city of Kirin is the capital of Kirin province; its population has been estimated as high as 100,000. Tsitsihar, capital of Heilungkiang, has perhaps 60,000 inhabitants.

Other important cities are: Antung, with an estimated population of 160,000, though this figure may be far too large; Kwangchengtze (Changchun), 80,000; Harbin, 68,000; Newchwang (Yingtze), at the mouth of the Liao River, 75,000; Newchwang City, 30 miles up the Liao, 50,000; Liaoyang, 40,000; Tiehling, 28,500; Fengwangcheng, 25,000; Sinminfu, 20,000; Fakumen, 19,500; Taonanfu, a town that has recently risen to importance, near the Mongolian border. Urban populations are little better than conjectural, and the fig-

ures here given must be regarded as only rough approximations. The Manchu population has practically disappeared, and the country has been colonized from the northern provinces of China proper. The immigration still continues, fostered by improved railroad facilities and the remarkable success of the soy bean industry.

Manchuria has one of the richest soils in the world, and it has grown more rapidly in wealth than any other part of the Chinese dominions. Important products, besides the soy bean, are millet, Kafir corn, wheat, rice, and tobacco. The net imports and the exports in 1914 were valued at 73,988,133 and 88,391,789 haikwan taels respectively (including the trade of the Japanese leasehold of Kwantung, q.v.). Both Russian and Japanese influence is exerted to develop the industrial and commercial interests of the country. The reported length of railway, which connects with the Chinese and Korean systems and includes part of the Trans-Siberian line, is about 2200 miles.

**MANGANESE.** See CHEMISTRY, INDUSTRIAL, *Metals*.

**MAN IN AMERICA, EARLY REMAINS OF.** See GEOLOGY.

**MANITOBA.** One of the Northwest Provinces of the Dominion of Canada, situated east of Saskatchewan and west of Ontario and Hudson Bay. The capital is Winnipeg. Area, 251,832 square miles, of which 19,906 water. This area includes that portion of the Northwest Territories annexed to Manitoba in 1912. Previously the area of the province was 73,732 square miles; between 1901 and 1911, the population of this area increased 78.52 per cent, or from 255,211 to 455,614. In 1911 Winnipeg had 136,035 inhabitants, being the third city in size in Canada; Brandon, 13,839; St. Boniface, 7483. Of the population 10 years of age and over in 1911, males numbered 192,815 (56.33 per cent) and females 149,498 (43.67); of these, 155,900 males and 22,206 females were reported as employed in gainful occupations. Of the males employed, 44.3 per cent were in agriculture, and of the females 44.9 per cent in domestic and personal service.

The provincial government is administered by a lieutenant-governor, appointed by the Governor-General of the Dominion; he acts through a responsible ministry of seven members. The Legislative Assembly is unicameral and consists of 49 members elected for five years. In the 12th Parliament, which convened in 1911, Manitoba was represented by four senators and 10 members of the House of Commons; the representation in the Commons on the basis of the 1911 census is 15. The Lieutenant-Governor in 1916 was Sir Douglas Colin Cameron, appointed Aug. 1, 1911, in succession to Sir D. H. McMillan.

**MANNING, RICHARD I.** Re-elected Democratic Governor of South Carolina Nov. 7, 1916. See SOUTH CAROLINA.

**MANUFACTURES.** See UNITED STATES and other countries, under section entitled *Manufactures*.

**MANURES.** See FERTILIZERS.

**MARATHONS.** See CROSS COUNTRY RUNNING AND MARATHONS.

**MARINE, NICHOLAS, CARDINAL.** See ROMAN CATHOLIC CHURCH.

**MARINE DISASTERS.** See SHIPPING; WAR OF THE NATIONS.

**MARITIME PROVINCES.** The Canadian provinces of New Brunswick, Nova Scotia, and Prince Edward Island. See these titles and also CANADA.

**MARKETING.** See HORTICULTURE; UNITED STATES DEPARTMENT OF AGRICULTURE.

**MARKHAM, SIR ARTHUR BASIL.** A British member of Parliament, died in London Aug. 5, 1916. He was born in 1866 at Tapton House, Derbyshire, and after gaining an education at Rugby became a newspaper correspondent and coal-mine owner. While correspondent of the *London Times*, at the time of massacres in Macedonia and Armenia, he was captured by the Kurds and the British government had to use extreme measures to procure his release. From 1900 he had held a seat in the House of Commons as member for the Mansfield division of Nottinghamshire. In 1911 he was made a baronet. Sir Arthur, who identified himself with the so-called "Ginger Group" in the House, became one of its most prominent members. Since the beginning of the European war he had attacked the methods of the war department.

**MARKHAM, SIR CLEMENTS ROBERT.** A British geographer, traveler, and author, died in London Jan. 30, 1916. The son of a clergyman and grandson of an Archbishop of York, he was born at Stillingfleet, Yorkshire, in 1830. After studying at Westminster School, he entered the navy, in 1844, and was a lieutenant when he retired in 1852. During his service he had been with the Franklin Search Expedition, his experiences of which he published as *Franklin's Footsteps* (1852). Later he traveled in Peru, where he investigated the remains of the Incas, and in India, where he supervised the introduction, from South America, of the quinine-yielding cinchona plants. By 1862 he had written two more volumes. For 10 years (1867-77) Markham had charge of the geographical department of the India Office. Of the Royal Geographical Society he was honorary secretary (1863-88), founder's medalist, president (1893-1905), and then vice-president to 1912, and he was largely responsible for the fitting out of Sir George Nares's Arctic Expedition (1874) and of the British National Antarctic Expedition (1910-12): Captain Robert F. Scott was his personal choice for commander of the latter. Markham, who was created K.C.B. in 1896, held the presidency of the International Geographical Congress from 1894 to 1899, and received the degree of D.Sc. from Cambridge and Leeds. Among many works, and besides that mentioned he wrote: *Threshold of the Unknown Regions* (1874), a summary of the history of Arctic exploration; *Memoir of Archbishop Markham* (1906); *Richard III* (1907); *King Edward VI* (1908); *The Incas of Peru* (1910).

**MARKIEWICZ, COUNTESS GEORGINA.** See GREAT BRITAIN, *History*.

**MARK TWAIN.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, American.

**MARRIAGE RATE.** See VITAL STATISTICS.

**MARQUIS, DON.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, American.

**MARRIAGE AND DIVORCE.** Probably no social institution of fundamental importance has received as much discussion involving revolutionary proposals during the past few years as has the family. Even before the war the feminist movement, involving as it did greater

economic independence for women and practically changed political and social relations, had been accompanied by proposals for radical changes and wide-spread discussion of marriage and divorce. The European war greatly accentuated radical tendencies; whereas in belligerent countries the proportion of women of marriageable ages already previous to the war exceeded the number of men of similar ages, the balance of the sexes was violently disturbed by the killing and permanent injury of millions of adult males. Moreover, the progress of the eugenics movement, the spread of knowledge of birth control, and the opinion of many statesmen and publicists that the declining birth rate might involve the ultimate destruction of Western nations had prepared the public mind for a frank discussion of various proposals for regulating marriage and reproduction. In addition war itself inevitably disturbed the established rules of sex relation. From England, France, and Germany alike came proposals that all births whether legitimate or illegitimate should be treated on a plane of exact equality both in law and in public sentiment. The condition prevailing during and after the Thirty Years' War, when polygamy was socially sanctioned, was frequently cited with approval. It was widely insisted that the community should take effective measures to control prospective motherhood and fatherhood for racial and national advantage. In England opinion was sharply divided between those who held that women should voluntarily undertake unrestrained child bearing in order to replenish the depleted ranks of the population and those who contended that the preservation of the improved economic independence and social status of women requires that marriage be undertaken cautiously and child bearing be reasonably restrained. The latter opinion also emphasized the great economic stress which would continue long after the war ended as a condition unfavorable to marriage and large families. A much discussed proposition in England was that the surplus of single men in the colonies should be utilized to supply husbands for the widows and single women of England. In France it was generally believed that the war would put an end to the commercial and dowry marriage and would supply a much needed stimulation to the birth rate.

**NEW YORK.** A "Marriage Bureau Bill" was passed by the last Assembly of New York State. The aim of the bill was to put an end to the so-called "Marriage Trust" or aldermanic monopoly of New York City. It provided that the city clerk designate deputies in each borough to perform all civil marriage ceremonies. The ceremonies are to be held in the room in the municipal building which is to be set aside for this purpose and a fee of \$2 may be charged. This bill deprives the aldermen of the right to perform marriage ceremonies.

With reference to marriage ceremonies Jewish rabbis were warned by the District Attorney of New York against violating the laws of the State by marrying couples who had not obtained a license in that State. Most of these breaches of law had been committed through ignorance, and the rabbis were urged to carry out the law at all marriage ceremonies.

On April 14th the Newton or Marriage Annulment Bill was made a law in New York State. It provided that the marriage of per-

sons living in New York performed in another State may be annulled in New York in case the bride was of the age under which the consent of parent or guardian was required in the State where the ceremony was held.

**MARRIAGE VOWS AND THE CHURCH.** In eliminating the words "With all my worldly goods I thee endow" from the wedding ritual the Methodist General Conference in session at Saratoga Springs, N. Y., in May made a step toward equalizing marital relations. The responses of the bride and bridegroom in the marriage services of that church are now the same. Also in the General Conference of the Protestant Episcopal Church which met in St. Louis, October 11th-26th, the joint commission on legislation on matters relating to holy matrimony recommended in a minority report radical changes in the marriage ceremony. It was proposed to make the responses the same for both man and woman, and to eliminate the man's declaration of endowing the woman with all his worldly goods. These proposed changes were referred to the commission on the prayer book, and will be considered again in the general convention of 1919. The joint commission also recommended a church law which would make it impossible for a person divorced for any cause arising after marriage to be married again by an Episcopal clergyman. This proposed change was rejected, but the discussions incident to its presentation and the vote showed the lay delegation for the Southern dioceses unanimous for the existing regulation, that for the Eastern dioceses divided, while the delegations for Northern and Western dioceses were almost unanimously in favor of the new canon. The vote of the conference as a whole, voting by dioceses, recorded the clerical delegates as 40½ affirmative to 23¾ negative, and the lay delegates 29 affirmative to 32¾ negatives.

**Bibliography.** The following books were published in 1916: J. M. Donovan, *Law of Marriage, Annulment, Domicile, Divorce*; a series of three pamphlets, issued by Longmans, Green & Company on *Marriage: a Harmony of Body and Soul* by G. Bailey, on *Successful and Unsuccessful Marriages* by L. Creighton, and on *Marriage as a Career* by H. E. Crossman; Walter M. Gallichan, *The Great Unmarried*; B. G. Jefferis and J. L. Nichols, *Searchlights on Health*; H. C. Johnson, *Courtship, Marriage, and Rearing Young*; C. D. Larson, *My Ideal of Marriage*; C. E. Young, *Marriage Question in the Modern French Drama*. The Division of Bibliography of the Library of Congress issued a bibliography on divorce in 1915.

**MARS, PLANET.** See ASTRONOMY.

**MARSEILLES-RHONE CANAL.** See CANALS; TUNNELS.

**MARSHALL, ARCHIBALD.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, English.

**MARSHAL OF FRANCE.** See FRANCE, *History*.

**MARTIN, SIR GEORGE CLEMENT.** An English organist and composer, died in London Feb. 23, 1916. He was born in 1844. For some years he was associated with the composer Stainer, first as pupil, later as master of the choristers and deputy organist at St. Paul's Cathedral, Stainer being organist. In 1888, on Stainer's resignation, Martin, who had already been made a doctor of music by the Archbishop of Canterbury, was appointed

his successor. He became especially noted as a trainer of choir boys, and wrote a standard manual on this subject. As a composer, he followed closely the style of Stainer. Best known of his compositions is the *Te Deum*, which was sung on the steps of St. Paul's at the time of Queen Victoria's diamond jubilee in 1897. Shortly after this event Martin was knighted.

**MARTIN, GEORGE MADDEN.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, American.

**MARTIN, SIR RICHARD BIDDULPH.** An English banker, died in Tewkesbury Aug. 23, 1916. Born in London in 1838, he was educated at Harrow and at Exeter College, Oxford. He gained a prominent place in the financial world, as chairman of Martin's Bank, Ltd., and of the Assets Realization Company, the Debenture Corporation, and the Anglo-American Debenture Corporation. For a time, also, he was at the head of the British North Borneo Company. With the exception of seven years, he served in Parliament from 1880 to 1905, in the year of his retirement being made baronet. He held the presidency of the Institute of Bankers and in 1906 of the Royal Statistical Society. His interest in other fields brought him election as fellow of the Anthropological Institute and the Royal Geographical Society, and office in many philanthropic organizations.

**MARTIN, WILLIAM MELVILLE.** A Canadian statesman, appointed premier of Saskatchewan, Oct. 19, 1916. He had been a member of the Canadian Parliament since 1908 and had become prominent as a supporter of Sir Wilfrid Laurier, the Liberal premier. In addition to the premiership, he assumed the portfolio of education. When appointed he was only 39 years old.

**MARTINIQUE.** An island of the Lesser Antilles; a French colony. Area, 987 square kilometers (381 square miles). Population (1911), 184,084. The capital is Fort-de-France, with about 27,000 inhabitants. The imports in 1914 were valued at £853,899 and the exports at £1,149,116. Vessels entered 472, of 459,052 tons. The 1913 budget balanced at 5,413,345 francs, and the debt amounted, Jan. 1, 1914, to 6,404,256 francs.

**MARYLAND. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 1,368,240. The population in 1910 was 1,295,346.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

		Acreage	Prod. Bu.	Value
Corn	1916	700,000	27,800,000	\$24,297,000
	1915	710,000	24,850,000	15,158,000
Wheat	1916	640,000	10,240,000	17,510,000
	1915	638,000	10,272,000	10,786,000
Oats	1916	48,000	1,857,000	828,000
	1915	45,000	1,530,000	750,000
Potatoes	1916	43,000	4,085,000	5,433,000
	1915	44,000	4,268,000	2,646,000
Hay	1916	465,000	688,000	9,632,000
	1915	390,000	a 468,000	7,582,000
Tobacco	1916	25,500	19,835,000	3,142,000
	1915	22,000	b 16,280,000	1,384,000
Sw't potatoes	1916	9,000	1,134,000	998,000
	1915	8,000	1,040,000	728,000
Rye	1916	23,000	356,000	392,000
	1915	24,000	396,000	348,000
Barley	1916	6,000	192,000	140,000
	1915	5,000	170,000	119,000

a Tons. b Pounds.

See also AGRICULTURAL LEGISLATION.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments . . .	4,837	4,797
Average number of wage earners . . . . .	107,921	111,585
Capital invested . . . . .	\$251,227,000	\$293,211,000
Wages . . . . .	45,486,000	53,792,000
The value of materials used. . . . .	199,049,000	288,972,000
The value of products . . . . .	315,669,000	377,749,000

**MINERAL PRODUCTION.** Estimates for the coal production of the State in 1916 indicated a decrease from 4,180,000 tons to 3,700,000 tons, a loss of 11 per cent.

The coal output of the State in 1915 was 4,180,177 short tons, valued at \$5,330,845, compared with 4,133,547 short tons, valued at \$5,234,796 in 1914. The chief increase occurred in Garrett County. The number of men employed increased from 5403 in 1914 to 5664 in 1915.

**TRANSPORTATION.** The total railway mileage on June 30, 1914, the latest date for which statistics are available, was 1401 miles of single track. The Baltimore and Ohio with 336 miles, has the longest mileage in the State, the Philadelphia, Baltimore, and Washington has 329, the Western Maryland 272, and the Baltimore, Chesapeake, and Atlantic, 88. There has been practically no construction since this date.

**EDUCATION.** The total school population of the State in the year 1914-15 was 415,908. The total enrollment in the public schools in 1915-16 was 146,530. This includes the enrollment of county schools only. The number of teachers in county schools in 1915-16 was 4501. The average yearly salary of teachers in county schools was \$399.76. See also EDUCATION IN THE UNITED STATES.

**FINANCE.** The total receipts for the fiscal year 1914, which is the latest date available, were \$12,006,566. The disbursements amounted to \$12,999,561, leaving a balance on Sept. 30, 1914, of \$1,840,256. The bonded debt of the State in 1914 amounted to \$19,685,880.

**CHARITIES AND CORRECTIONS.** The board of State aid and charities has general control of the charitable institutions of the State. Most of the penal institutions, such as the city and county jails and the penitentiary, do not come under supervision of this board. It has general charge of a large number of homes and asylums for adults and children, and also has supervision over the general hospitals and insane hospitals. State aid is also given to a number of reformatories for children, some of which are under religious auspices and others sectarian. The Legislature of 1916 made some changes in the method of appropriations for the support of these institutions. In future appropriations, will be made on the per capita system, and not as heretofore in a lump sum. There are in the State 23 general hospitals, 7 hospitals for the insane, and 9 special hospitals. Convicts of the State are generally employed under contract, the majority being engaged in the manufacture of boots and shoes.

**POLITICS AND GOVERNMENT.** The campaign in Maryland in 1916 resulted in a decisive personal victory for President Wilson. He received the

largest plurality cast for a Democratic candidate in more than a generation, with the exception of 1912. The personal character of the President's victory was demonstrated by the facts first that a bitter factional fight between the Democratic State organization and the party organization for Baltimore city, which embraces approximately half the population of the State, led to a refusal on the part of the latter to cooperate with the former in the conduct of the campaign, resulting in duplication of work, friction, distraction of party workers, and marked inefficiency; that a very considerable number of prominent professional and business men affiliated with the Democratic party declared themselves for Mr. Hughes, and attempted to organize the Democrats on the latter's behalf; that the Republican management of the campaign was conducted in an unusually vigorous manner, and was better financed than in many years.

Although President Wilson carried the State, Congressman David G. Lewis, Democratic nominee for Senator, was defeated by Dr. Joseph I. France, Republican. Mr. Lewis was defeated by adverse pluralities in Baltimore city and Baltimore County. He carried the other sections by very substantial pluralities. His defeat was due to open opposition from the Democratic organization in Baltimore city, which held him to be the candidate for the State organization with which it was at odds; opposition from the organized liquor forces; and probably to opposition from certain public utilities which were antagonistic to him because of his support of government ownership of telegraph and telephone lines, and his alleged support of the government ownership propaganda in general.

The Democrats elected four of the six Representatives, while in the previous election they elected five. The district lost was the sixth, which is normally Republican, and which Mr. Lewis had carried three consecutive times.

The vote for President was: Wilson 138,359, Hughes 117,347, Hanly 2903, Benson 2674, and Reimer (Labor) 756.

An amendment to the State constitution providing an executive budget system for handling business finances was adopted by a vote of 77,408 to 36,100. Students of the subject hold that this budget system is the most scientific in construction, and the most radical in governmental changes effected to be found in the United States. Statutory prohibition was voted on in the sections of the State, that were under license. Each subdivision voted as a unit. Seven of the 11 units voted against prohibition. Baltimore city vote was 29,921 for, and 75,137 against.

**LEGISLATION.** The Legislature met in 1916 and passed many important measures. A record of these follow:

Provision was made for the creation of a juvenile court in any county where all the judges in the circuit deem it necessary. The court has jurisdiction over dependents, neglected, and delinquent male children under 20, and females under 18. Permission was given to juries to add to first degree murder verdicts the words "without capital punishment," in which case the court shall impose a life sentence and not a death penalty. An agricultural system to develop the agricultural resources of the State was incorporated. The purity and sale

of seeds was regulated. The conservation commission to control fish, game, and fur-bearing animal resources was created. A State board of motion pictures censors was also created. The laws relating to the practice of medicine were amended. There was created a State board of labor and statistics to take the place of existing agencies for the administration of all labor laws except the workmen's compensation act. Many other changes were made in laws regulating employment. A State labor board was authorized to investigate the extent and causes of unemployment and remedies therefor.

**STATE OFFICERS.** Governor, Emerson C. Harrington; Secretary of State, Thomas W. Simmons; Auditor, J. Enos Ray; Comptroller, Hugh A. McMullen; Treasurer, John M. Dennis; Adjutant-General, Henry W. Warfield; Attorney-General, Albert C. Ritchie; Superintendent of Education, M. B. Stephens; Commissioner of Insurance, W. Mason Shehan—all Democrats.

**JUDICIARY.** Court of Appeals: Chief Judge, A. Hunter Boyd; Associate Judges, N. Charles Burke, William H. Thomas, John R. Pattison, Hammond Urner, John P. Briscoe, Henry Stockbridge, and Albert Constable; Clerk, Caleb C. Magruder.

**STATE LEGISLATURE.** No session in 1917.  
**MARYLAND, UNIVERSITY OF.** A non-sectarian co-educational institution at Annapolis and Baltimore, Md. It was founded in 1784. In the fall of 1916 there were 1400 students and 211 faculty members. The university has productive funds amounting to \$150,000, and in 1916 from all sources it drew an income of \$200,000. There are 25,000 volumes in the library. Provost, Thomas Fell.

**MASEFIELD, JOHN.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction, Poetry, History, etc.*, English.

**MASON, FRANK HOLCOMB.** An American consular officer, died in Paris June 21, 1916. He was born at Niles, Ohio, in 1840, and studied at Hiram College, but did not graduate. In the Civil War he was promoted from private to captain for his services at Vicksburg; for a time he was a prisoner in Libby Prison. After the war he entered newspaper work, first as a reporter for the *Cleveland Leader*, and later as editorial writer and managing editor till 1880. In that year he received an appointment as United States consul at Basle, Switzerland, where through his efforts a stop was put to the undervaluation of silks and aniline dyes shipped to this country. After four years he was transferred to Marseilles, where he remained till 1889. It was while at this post that he made a record for his services in connection with an epidemic of cholera. He prepared a series of valuable reports on the subject of this disease and its treatment, published in collected form by the United States government. For a decade (1889-99) Mr. Mason was consul-general at Frankfort-on-the-Main, Germany. In that country he did much to expand the market for American goods, especially during six years as consul-general at Berlin. From 1905 to his retirement in 1913, he held a like office in Paris. Continuing to reside in the French capital, he had recently been chairman of the American Ambulance Hospital there.

**MASPERO, GASTON CAMILLE CHARLES.** A French Egyptologist, died in Paris June 30, 1916. Born in the French capital June 24,

1846, he studied the Egyptian language privately as a youth and at 19 was adept in interpreting hieroglyphic inscriptions. After further studies at the Ecole Normale, and researches into the Indian dialects of Peru, made at Montevideo, he became connected with the department of Egyptology at the Ecole des Hautes-Etudes, three years later receiving his doctorate. In 1874 he accepted a chair in the Collège de France, in 1880 was sent to Egypt by the government at the head of the Mission Archéologique, and the next year was appointed director of the excavations and antiquities of Egypt. After five years he returned to Paris, where he again took his chair in the Collège and became director of Egyptological studies at the Ecole des Hautes-Etudes. From 1899 to 1914, when he was elected life secretary of the Académie des Inscriptions et Belles-Lettres, he occupied for the second time his post in Egypt. His first great work as a scholarly writer was done in his *L'Histoire ancienne des peuples de l'Orient*, published in 1875. A pioneer treatise in its wide scope, it was frequently revised and published in new editions. Other works, as translated into English, are: *Manual of Egyptian Archaeology; The Dawn of Civilization; Egypt and Chaldea; The Struggle of the Nations: Egypt, Syria, and Assyria; The Passing of the Empires; A Complete History of Egypt* (12 vols.); *New Light on Ancient Egypt*; and *Art in Egypt*. In French his writings are very numerous. Foreign recognition came to Maspero when the King of England conferred on him the K.C.M.G. in 1909.

**MASSACHUSETTS. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 3,747,564. The population in 1910 was 3,366,416.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

		Acreage	Prod. Bu.	Value
Corn	1916	42,000	1,764,000	\$2,117,000
	1915	48,000	2,804,000	1,848,000
Oats	1916	15,000	480,000	317,000
	1915	12,000	432,000	220,000
Potatoes	1916	25,000	2,275,000	3,981,000
	1915	26,000	3,120,000	2,933,000
Hay	1916	480,000	a 749,000	14,231,000
	1915	470,000	705,000	15,510,000
Tobacco	1916	7,800	b 12,118,000	3,080,000
	1915	8,800	9,680,000	1,404,000
Rye	1916	3,000	56,000	71,000
	1915	3,000	60,000	61,000

a Tons. b Pounds.

See also AGRICULTURAL LEGISLATION.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments	11,684	12,013
Average number of wage earners	584,559	606,698
Capital invested	\$1,279,687,000	\$1,548,961,000
Wages	301,174,000	341,310,000
The value of materials used	830,765,000	981,384,000
The value of products	1,490,529,000	1,641,378,000

**TRANSPORTATION.** The total railway mileage including tracks of all kinds in 1916 was 5062.

This includes 2157 miles of main track, 1154 of second, third, and fourth tracks, and 1749 of side tracks. The increase in mileage during the year was 26.

**EDUCATION.** The school census was taken on Sept. 1, 1914. It showed children between 5 and 16 years of age to number 651,971. The total enrollment for the school year ending June 30, 1915, was 591,582. The average daily attendance was 506,910. The school year ended June 30, 1915. The number of teachers was 18,242. The statistics for the monthly or yearly salary of teachers are not available.

**FINANCE.** The total receipts from all sources for the fiscal year 1916 amounted to \$58,988,750, and the disbursements to \$59,449,601. The balance at the beginning of the year was \$11,924,400, and at the end of the year was \$11,463,549. The chief sources of revenue are the corporation tax, inheritance tax, and savings bank tax. The chief expenses are for departmental expenses, and payments for interest and serial bonds. The bonded debt of the State less sinking funds on Dec. 1, 1916, amounted to \$85,666,682.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include: the State Infirmary at Tewksbury, the State Farm at Bridgewater, the Norfolk State Hospital, the Lyman School for Boys at Westborough, the Industrial School for Boys at Shirley, the State Industrial School for Girls at Lancaster, the Massachusetts Hospital School at Canton, the North Reading State Sanatorium, the Rutland State Sanatorium, the Lakeville State Sanatorium, and the Westfield State Sanatorium. The inmates receiving care number about 20,000 each year, and the cost of maintenance is about \$1,500,000. The prisons, which include the State Prison in Boston, the Massachusetts Reformatory at Concord, Reformatory for Women at Sherborn, Prison Camp and Hospital at Rutland, State Farm at Bridgewater, are under the control of a Board of Prison Commissioners.

**POLITICS AND GOVERNMENT.** The Legislature met in 1916 and passed a number of important measures. These will be found recorded in the paragraph *Legislation* below. On April 25th the Republicans elected uncompromised delegates to the national convention. There were elections for Governor and other State officers, and United States Senator. Senator Lodge was a candidate for reelection, and was renominated by the Republicans. Governor McCall was also renominated. In the election of November 7th, Governor McCall received 276,123 votes, compared with 229,883 for Mansfield, his Democratic opponent. Senator Lodge received 267,157 votes, compared with 234,199 for Fitzgerald, his Democratic opponent. For President, Hughes received 278,265 votes, compared with 247,845 for Wilson. The Socialist candidate, Benson, received 11,058 votes. For United States Senator, McDonald, Socialist candidate, received 15,558 votes.

**LEGISLATION.** The Legislature met in 1916, and passed a number of important amendments. Record of these follow:

The civil and criminal jurisdiction of district or municipal courts was so extended that their process runs throughout the State, and makes them courts of superior and general jurisdiction. The board of prison commissioners and the boards of parole were abolished, and a bureau of prisons under a director, and with an ad-

visory board of three men and two women, and a board of parole of three members were created. The economic and efficiency system was abolished, and a supervisor of administration was substituted. The increase in salaries of State employees without the approval of the government in council was forbidden. The laws relating to primary ballots were amended in important particulars. The question of calling a constitutional convention was submitted to the general election of 1916. Authorization was given to cities to establish by referendum day or night schools in agriculture and horticulture, under the supervision of the State Board of Education. A commission was created to investigate physical training for boys and girls in public schools, especially with a view to military training. A reserve list of officers of the military and naval militia was created. Other laws relating to the militia were passed. An income tax was enacted. Incomes from investments except from savings bank deposits, or bonds of the United States, or of the State are taxed 6 per cent. Incomes from trade, professions, and business are taxed 1½ per cent on the excess over \$2000. Laws for the prevention of forest fires were enacted. A social insurance commission to study the effects of sickness, unemployment, and old age was created, and also a commission to investigate the uses of habit-forming drugs, and the effectiveness of preventive laws. Laws relating to insurance were amended.

The Legislature enacted so many amendments to the State constitution that that body decided to submit none of them to the people, but to refer instead a proposition for a constitutional convention. Prominent among the problems which it was hoped such a convention might work out were those relating to taxation and assessment. The last constitutional convention held in the State was in 1853.

A new law intending to prevent misstatements in advertising went into effect on May 25th. This law prohibits unlawful statements of valuation in excess of advertising prices, false declarations, misstatements regarding securities offered for sale, misleading statements designed to induce the public to patronize the advertiser, and other intentional deceptive advertising.

**STATE OFFICERS.** Governor, Samuel W. McCall, Rep.; Lieutenant-Governor, Calvin Coolidge, Rep.; Secretary of State, Albert P. Langtry, Rep.; Treasurer, Charles L. Burrill, Rep.; Auditor, Alonzo B. Cook, Rep.; Adjutant-General, Gardner W. Pearson, Dem.; Attorney-General, Henry C. Attwill, Rep.; Secretary of the Board of Agriculture, Wilfrid Wheeler; Commissioner of Insurance, Frank H. Hardison; Commissioner of Education, Payson Smith.

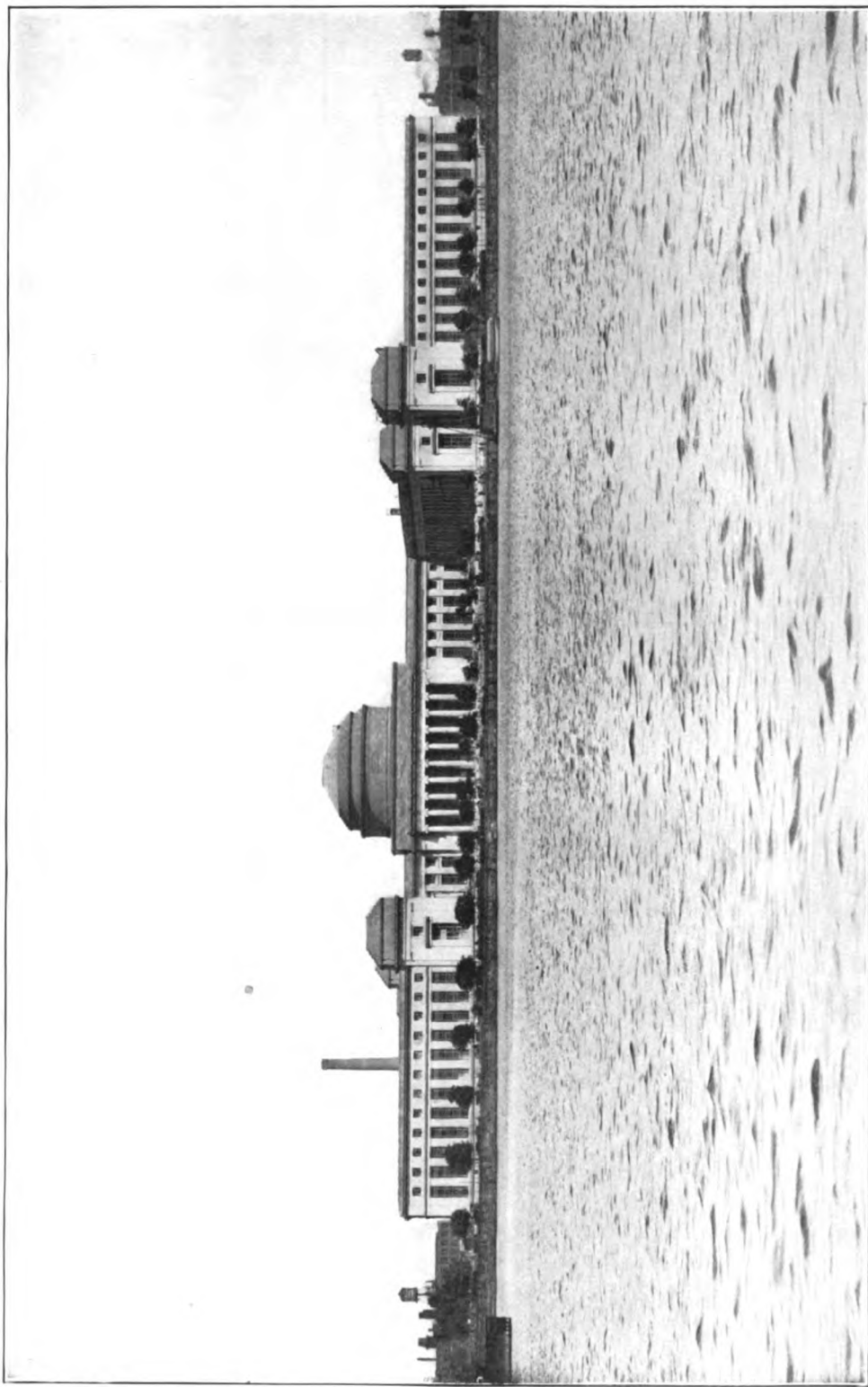
**JUDICIARY.** Supreme Judicial Court for the Commonwealth: Chief Justice, Arthur Prentice Rugg; Justices, Edward P. Pierce, William C. Loring, Henry K. Braley, James B. Carroll, Charles A. De Courcy, John C. Crosby.

**STATE LEGISLATURE.**

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Republicans .....	84	170	204
Democrats .....	6	68	74
Socialists .....	..	1	1
Independent .....	..	1	1
Republican majority..	28	100	128

See also CITY PLANNING,





NEW BUILDINGS OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, FROM ACROSS THE CHARLES RIVER  
William Welles Bosworth, Architect



**MASSACHUSETTS INSTITUTE OF TECHNOLOGY.** A non-sectarian technical institution in Cambridge, Mass. It was founded in 1861. In the fall of 1916 there was a total enrollment of 1957 and there were 130 faculty members. During the year C. Frank Allen, professor of civil engineering, retired. An officer of the engineering corps of the United States army was detailed to assist the professor of military science. Four new instructors, resident at certain companies where students in chemical engineering practice study, were added to the faculty. To establish a school of chemical engineering practice, \$300,000 was received. Total gifts amounting to about \$5,800,000 were received during the year. A large part of this was secured as endowment, more than half being given by an unnamed donor. A notable event in the history of the institution was the transfer of its plant from Boston to a group of magnificent new buildings in Cambridge, the dedication of which in June was made the occasion of an elaborate celebration. The new buildings have about 18,000 rooms. (See ARCHITECTURE, *Educational Buildings*.) The productive funds of the institute amount to \$4,800,000 and the income for 1916 was \$200,000. The library contains 135,000 volumes. President, Richard Cockburn Maclaurin.

**MASTERS, EDGAR LEE.** See LITERATURE, ENGLISH AND AMERICAN, *Poetry*, AMERICAN.

**MATTER, CONDITIONS OF.** See CHEMISTRY, GENERAL.

**MAURIN, LOUIS JOSEPH, CARDINAL.** See ROMAN CATHOLIC CHURCH.

**MAURITANIA.** A civil territory of the government-general of French West Africa (q.v. for area, population, etc.). Considered from the ethnical point of view as the country inhabited by the descendants of the mixed Arab and Berber races known under the name of Moors, Mauritania is that region included within the south and west frontiers of the Sahara, the Atlantic coast, and the Senegal and the Niger rivers. A part of the population is of the same race as those to be found in Senegal—Oulofs, Peuhls, Toucouleurs, etc.; but the majority are Moors, invariably of Islam strongly tinged with Sufism. With the exception of palm-tending groups, they are nomads, exclusively occupied in grazing. The negroes gather forest products, cultivate grains, etc., and catch and dry fish. Little information concerning the commerce of the country is available; in the oases the primitive method of barter obtains. Travel is by caravans. The chief towns are: Port-Etienne, Boutilimit, Aleg, Selibaby, etc.

**MAURITIUS.** A British crown colony; an island in the Indian Ocean. Area 720 square miles. At the 1911 census, the total population was 368,510. The natives of European race are in large part French creoles. Port Louis, the capital, had (1911) with suburbs, 50,060 inhabitants; Curepipe, 17,173; Mahébourg, 4068. The cultivation of sugar-cane is the staple industry. Total imports and exports (1914), including shipping charges on home products, \$7,959,939 rupees and 59,965,797 rupees respectively. Revenue 1913-14, 11,142,611 rupees; expenditure, 10,218,470 rupees; customs revenue, 4,202,476 rupees. Tonnage entered and cleared (1914), 874,969. External debt, June 30, 1914, \$1,279,990.

The inhabitants showed from the outbreak of

the war an active sympathy with France, and from the beginning of the war gifts of all kinds were contributed to the public cause. A Mauritian committee was founded in Paris and others were established on the island. Money and supplies were sent to the French authorities and it was estimated toward the close of 1916 that over 1,000,000 francs had been contributed by the island. Conscription was not in force there. Nevertheless, the inhabitants, including many who belonged to the leading families, joined the colors of France or England. Many lost their lives at the front. The rector of the Royal College pronounced a eulogy after reading a long list of students who had fallen on the field of battle.

**MAYOTTE AND THE COMORO ISLANDS.** A group of islands belonging to France, administered under the Government of Madagascar. Area, 2168 square kilometers (837 square miles); population, as estimated Jan. 1, 1914, 97,900. Imports and exports 1914, 2,296,575 and 2,874,019 francs respectively.

**MAXIM, SIR HIRAM STEVENS.** A British engineer and inventor, died in London, England, on Nov. 24, 1916. He was born in 1840 at Sangerville, Maine, U. S. A., where he received his early education. After being apprenticed to a coach builder, he worked in his uncle's engineering establishment at Fitchburg, Mass., later becoming foreman in an instrument factory. After this he was employed in the Novelty Iron Works and Shipbuilding Company in New York. In addition to his regular employment he had taken out patents for various improvements in steam engines and had put on the market an automatic gas machine. He invented the system of flashing which made incandescent lighting possible, and also perfected other electrical devices, some of which were exhibited at the Paris Exposition of 1881. In the latter year he went to England, where he proceeded to develop his automatic system of firearms, his most celebrated invention being the Maxim gun, a weapon loaded and fired by the energy of its own recoil. Besides more than 100 international patents relating to petroleum and other motors, his inventions included explosives and ordnance materials. Among the former was a smokeless powder. He had also become deeply interested in aerial navigation.

He bought an estate near Bexley, England, where he built laboratories and an experimental station and carried on elaborate experiments in aeronautics, constructing in 1894 a large-power flying machine. One of his latest devices was an apparatus for counteracting the effect of poisonous gases in the European war. This was first used in 1915 by the Allies. During the few months preceding his death he was working on a new type of aeroplane intended to be of great speed and relatively small fuel consumption. For many years he was a member of the British ordnance firm of Vickers' Sons and Maxim. Alleging unfair treatment of his inventions by the United States government he became a naturalized citizen of Great Britain, and was alienated from his brother, Hudson Maxim, who remained in the United States. The French government made him a Chevalier of the Legion of Honor. Queen Victoria knighted him in 1901. He was a member of many learned societies. He published

*Artificial and Natural Flight* (1908), and his autobiography, *My Life* (1915).

**MEARS, HELEN FARNSWORTH.** An American sculptor, died in New York City Feb. 17, 1916. She was born in Oshkosh, Wis., in 1878, and early gave evidence of talent as a sculptor. At 14 she won a prize at the World's Fair, Chicago, for the best symbolic figure of Wisconsin. Later, after attending the Wisconsin State Normal College, she studied at the Académie Julian in Paris, and under Augustus Saint-Gaudens, who held a high opinion of her work. Her statue of Frances E. Willard is in the Capitol at Washington, and her "Fountain of Life" was awarded a medal at the St. Louis Exposition in 1904. Miss Mears was known also for portrait reliefs of Alexander MacDowell and of Saint-Gaudens and for busts of George Rogers Clark and Dr. William L. G. Morton (Smithsonian Institution). She left uncompleted a fountain for one of the New York City parks.

**MEAT SUPPLY.** See STOCK RAISING AND MEAT PRODUCTION.

**MEDALS FOR CHEMICAL RESEARCH.** See CHEMISTRY, INDUSTRIAL.

**MEDICAL EDUCATION.** The annual presentation of educational data by the council on medical education of the American Medical Association shows, among other interesting facts, that there were 14,022 medical students in the United States for the year ending June 30, 1916. Of the total number 13,121 attended non-sectarian or regular colleges, 638 homeopathic institutions, and 263 eclectic colleges. The total number of graduates for the year was 3518, of which 3274 were from non-sectarian colleges, 166 from homeopathic colleges, and 78 from eclectic schools. The rising standard of preliminary education is shown in the high proportion of students holding degrees in arts or science. There were 566 women matriculants and 134 graduates.

**MEDICAL EXAMINERS, NATIONAL BOARD OF.** The National Board of Medical Examiners of the United States, founded in 1915, by Dr. W. L. Rodman, who died March 8, 1916, while president of the American Medical Association, has added some to its directorate, entirely of physicians, which includes Victor Vaughan, Surgeon-General Blue, Surgeon-General Gorgas, Austin Flint, and Herbert Harlan. Col. Louis A. La Garde is treasurer, and Surgeon-General Braisted is president, the office of the secretary, J. S. Rodman, being at 2106 Walnut Street, Philadelphia. The object of the Association is to establish a standard for examination and registration of physicians in the United States, to cooperate with boards of medical examiners in all the States, and in effect to raise the requirements for physicians in this country. The board has been endorsed by several bodies, including the American Medical Association, American Association of Military Surgeons, Clinical Congress of North America, and several Academies of Medicine.

**MEDICAL PROGRESS.** There has been notable activity in the study of infectious diseases and several new specific microorganisms have been identified. (See DIPHTHERIA, EPILEPSY, HEMORRHAGIC JAUNDICE, PARATYPHOID FEVER, POLIOMYELITIS, RABIES, RAT-BITE FEVER, ROCKY MOUNTAIN SPOTTED FEVER, TYPHOID FEVER, TYPHUS FEVER.) Our knowledge as to diseases due to hot climates has been advanced in many directions. (See LEP-

ROSY, MALARIA, TROPICAL DISEASES.) The ultimate causes of cancer have engaged the continuing attention of many investigators (see CANCER), and the diagnosis of tuberculosis has been made more exact. (See TUBERCULOSIS, TUBERCULIN.) The use of serums and vaccines in the cure and prevention of diseases was greater than ever before. (See SEROTHERAPY, VACCINE THERAPY.) The European war gave rise to many surgical problems which have been met and solved. (See DAKIN'S SOLUTION, SOLDIER'S HEART, SURGERY.) Several new drugs or medicinal preparations have been introduced, among which may be mentioned, CHLOBAZENE, DIMAZON, KEPHALIN, PETROGAR. The relation of oral hygiene to general and local injections of the body has received an extraordinary amount of attention. (See STOMATOLOGY.) Other medical items and statistics will be found under their respective captions.

**MEDICAL SCHOOLS.** See UNIVERSITIES AND COLLEGES.

**MELANESIA.** See ANTHROPOLOGY.

**MELONS.** See HORTICULTURE.

**MEMORY AND RECOGNITION.** See PSYCHOLOGY, section so entitled.

**MEMPHIS.** See ARCHÆOLOGY.

**MEMPHIS FLOOD PROTECTION.** See FLOODS.

**MENDEL'S LAW.** See ZOOLOGY, *Heredity*.

**MENÉNDEZ PIDAL, JUAN AND RAMÓN.** See SPANISH LITERATURE.

**MENGES, ISOLDE.** See MUSIC, *Artists, Instrumentalists*.

**MENINGITIS.** See SEROTHERAPY.

**MENOCAL, MARIO GARCIA.** A Cuban political leader, reelected President of Cuba, the result being announced Nov. 5, 1916. He was opposed by Zayas, the Liberal candidate. See CUBA, *History*.

**MENTAL HYGIENE, NATIONAL COMMITTEE FOR.** See PENOLOGY.

**MENTAL TESTS.** See PSYCHOLOGY, section so entitled.

**MERCIE, ANTONIN.** A French sculptor and painter, died Dec. 15, 1916. He was born at Toulouse in 1845, studied under Jouffroy and Falguière, and in 1868 won the Prix de Rome. The merit of his "David Vainqueur" (1872) gained him admission to the Legion of Honor, and the fine patriotic group "Gloria Victis" (1874), now in the court of the Hotel de Ville, Paris, established his reputation. Other famous works are the high relief "The Genius of the Arts," for the so-called Guichet du Louvre; the group "Quand Meme" (1882) at Belfort (a replica is in the Gardens of the Tuileries); the statues of Meissonier (Louvre Gardens) and William Tell (Lausanne); the tombs of Cabanel and Michelet in the cemetery of Père-Lachaise and of Louis Philippe in Dreux Cathedral; the figure "Remembrance" in the Luxembourg; the monument to Gounod for the Parc Monceau; Lee, in Washington; and Francis Scott Key, in Baltimore. His best work combines technical skill, feeling, and a certain grandeur of conception, with rhythm, movement, and delicacy of sentiment. He was also successful as a painter in such canvases as "Venus" and "The Sleeping Nymph." In 1891 he was elected a member of the Académie des Beaux-Arts.

**MERCIER, DESIRÉ JOSEPH, CARDINAL.** See BELGIUM, *History*.

**MERCURY.** See QUICKSILVER.

**MESOPOTAMIA.** See WAR OF THE NATIONS.  
**METALLURGY.** The chief function of the metallurgist in 1916 was to do his utmost to increase the output of metals from the various refineries and other plants in order to meet the vast demands provoked by the great war. At the same time in the neutral countries the general prosperity was in some part due to the demand for metals and the high values prevailing. Accordingly, the metallurgist was concerned mainly with direct problems of production, with the design and construction of new plants to work modern processes efficiently and on a large scale, and with the recovery of metal from low grade ores that once would not have been considered worth treating. Consequently little time or opportunity was left for independent research and investigation, and as a result there were few important discoveries or radical innovations in practice introduced, though much time was spent on testing and experiment in the case of new methods or processes which promised well. The development of the flotation method for treating various ores continued and much more was learned both as to its practice and advantages and as regards its theory. In electro-metallurgy there were developments rather in the direction of increased use and more intensive application in the United States and also in Europe, especially in Norway and Sweden where cheap water power and the high prices prevailing for metals led to increases in the capacity of plants. The more significant features of the metallurgical development of the year, based mainly on the authoritative annual reviews in the *Engineering and Mining Journal*, the *Iron Age*, and *Metallurgical and Chemical Engineering*, are summarized in the accompanying paragraphs.

**FLOTATION PROCESS.** The great success of the flotation process led to its extensive use, in fact by practically every large copper company, and produced considerable litigation under the various patents. On Dec. 11, 1916, what was up to that time the most important decision in the matter was handed down by the Supreme Court of the United States in the case of Minerals Separation, Ltd., and Minerals Separation American Syndicate, Ltd., vs. James M. Hyde. The court upheld the original patent in a number of important claims. The decision dealt with the amounts of oil used, specified as less than 1 per cent of the amount of ore, and in processes where greater amounts are used the patents of the Minerals Separation, Ltd., were decided not to be infringed. Inasmuch as some 25,000,000 tons of ore were beneficiated by this process in 1916 and only about one-half of this was worked under license of the patentees, a striking situation developed which would require a vast amount of adjustment and heavy payments by those infringing. The royalties that were being paid in 1916 varied from 12 cents for each short ton where the tonnage did not run over 4000 tons per day, on a sliding scale to 4 cents per ton when it amounted to or exceeded 30,000 tons daily. This Supreme Court decision seemed to dispose of the validity of the patents so far as their essentials were concerned, but at the end of the year there was another case, that of the Miami Copper Co. against the same owners of the patents, awaiting decision from the Supreme Court in which other elements were pres-

ent. The lower court had decided in favor of the Minerals Separation, Ltd.

Flotation was practiced extensively during the year with the copper and zinc ores, as at plants like Butte and Superior in the case of zinc ore handlers, and Anaconda, Inspiration, and the mills working porphyry copper bearing ores. It was believed that the same process could be used with the sulphide ores, especially the silver sulphides found in abundance in Mexico, Western United States, and elsewhere, and also with the ores of some of the rarer metals, such as molybdenum. Many varieties of oils were tried in the flotation process, and for the frothing agents vegetable oils were employed, while to place the oil film on the mineral particles cheaper mineral oils were often used. Oil derived from the sage brush was used with some success and some of the coarser grades of mineral oil.

**GOLD AND SILVER.** During 1916 most of the world's gold mines were being worked to the extreme physical limits to secure adequate supplies of the metal for national and other debts. This involved new construction rather than great advances or changes in actual ore treatment. The increased use of the flotation process continued, and in addition a number of plants originally equipped for cyanide treatment were altered for flotation with increased economy claimed in the recovery of the metals. Flotation was being applied more to ores on a precious basis, as well as in processes where base metals had been treated and the gold and silver recovered as a by-product. In particular interesting developments were looked for in the use of large flotation installations in mills treating silver sulphide ores principally. The increased use of flotation, however, required improvements in the grinding machinery to secure a finer product, and with the better types of tube and ball mills there was also used a so-called Marathon mill where the action was produced by the falling on one another of cylindrical steel rods. While most of the big mills were employing flotation either regularly or on an experimental basis, yet cyaniding processes continued to be used and were found in several new plants. The stamp mill in many mines was being replaced by the Hardinge conical mill, and the old amalgamation process was being considered generally of less usefulness, and while it had not altogether disappeared, finding application in California, Colorado, Canada, and South America, yet it had become considered largely to be an auxiliary process. During the year, however, the combination of cyanide and flotation processes was studied in connection with the metallurgy of gold and silver.

**COPPER.** Naturally the metallurgy of copper in 1916 was influenced by the economic position of this metal, especially its high value and its being in extraordinary demand for war and other purposes. Not only were existing plants worked to or in excess of capacity, but new reduction works were established, and lean ores once neglected were receiving careful metallurgical attention. In fact, the average content of metal in the ores treated was showing a constant decrease and by-products, such as sulphuric acid and minor metal such as nickel, selenium, and tellurium, were figuring to an increased extent. The three main features of metallurgical progress in copper refining in 1916

consisted in flotation, leaching, and the recovery of sulphuric acid from smelter smoke. This involved to a notable degree in the new plants special and original design and equipment, as distinct from the adaptation of older plants to the newer processes. In flotation fine grinding mills were required and special methods for drying and smelting the concentrates. The different classes of ores lent themselves to different methods of treatment, and increased work with the flotation process led to a better understanding of its advantages as well as its limitations. For sulphide ores that yielded over 82 per cent from concentrates under the old wet concentration methods, the flotation method advanced the yield to 96 per cent. With mixed sulphides and oxides a separate hydrometallurgical method seemed more advantageous, though chemical treatment could be added to the flotation method.

The first large all-leaching plant in the United States was almost completed at Ajo, Ariz., by the New Cornelia Copper Co., with a capacity of 5000 tons. This had 11 lead lined tanks 88 x 88 x 15 for leaching, and two 7500 kilowatt turbines supplied power.

For the treatment of fumes from copper smelters the Cottrell process of electrostatic precipitation was finding application in the larger plants, and at many works the value of by-products was being fully realized. Sulphuric acid was being produced at several works, at one of which it was proposed to begin the manufacture of fertilizer. At one smeltery by the bag house method, zinkiferous fumes were being collected and treated so as to produce electrolytic zinc. In Australia further attempts were being made to recover elemental sulphur.

**LEAD.** During the year there were in progress several investigations where the chemical reactions in smelting lead ores were being studied with the aim of securing increased precision in the various operations and utilizing the results of the research of the chemist. In the equipment of the various smelters there were improvements such as the introduction of the Newnam mechanical ore hearth, where a mechanical device for working the charge replaced the hand hearth. This made possible profitable smelting in the open hearth as distinguished from the blast-furnace. In the latter an innovation of the year was the so-called "double treatment," where the "fines" were screened after being roasted and were retreated. A new crude oil burner was introduced during the year in the Dwight and Lloyd sintering machines. The new blast furnaces of the year all showed improvement in being water-jacketed from the top of the crucible to the feed floors or even lower by a double tier of jackets.

The collection of flue dust and fumes was also attracting attention and improved and cheaper forms of bag house construction were provided, while Cottrell electric precipitators were being used at lead as at other plants.

**ZINC.** With the great demand for spelter in 1916 most smelters were occupied to capacity, and while they were troubled by inefficient labor and the high cost of fuel yet they maintained a high rate of production that was in excess of the record year of 1915. For this reason there was not much opportunity to try out new methods or for the technical staff to indulge in research. Economies in natural gas, the cost of

which was rapidly rising, as well as in coal, were in order and various types of producers were being tested experimentally with that object. The retreatment of furnace residues was receiving much attention and various methods were in vogue either to obtain the silver and lead for lead blast smelting furnace, or to recover the last part of their zinc in the form of zinc oxide fumes. Redistillation in the refining of spelter was practised at a number of plants, resulting in a product of high purity. In this redistillation several rare elements were encountered in the residue. Among the notable works of the year was the construction of a smelting works in Vado bei Savona, Sardinia, by the Societa di Montepeni, the largest zinc producers in the island, with six furnaces of 240 retorts each. A coking plant was to be provided and two electric furnaces installed.

Large scale refining by redistillation in electric furnaces was carried on in Sweden and Norway, especially at Sarpsborg and Trolhättan, and at the latter place electric ore smelting was also done. In the United States a notable work was the completion and operation of the Great Falls refinery of the Anaconda Company producing electrolytic spelter. In addition electrolytic spelter was produced by the Consolidated Mining and Smelting Company of Trail, B. C., Canada. The hydrometallurgical-electrometallurgical process (see YEAR BOOK for 1915) was attracting considerable attention and a number of plants were under construction, in addition to a few smaller ones that were operating during the year. In Australia the Electrolytic Zinc Company was organized to erect a plant in Tasmania and treat ore from Broken Hill, New South Wales.

**IRON AND STEEL.** With the call for increased output from furnaces and mills in 1916 metallurgical advances were not of a striking nature when considered technically, though in some cases there was a note of progress in the ordinary developments. A few of the more important discoveries will be found discussed in the section on *Iron and Steel* in the article **CHEMISTRY, INDUSTRIAL**. Every American metallurgical plant was operating to capacity or beyond, and better organization and greater efficiency often was noted. The coke from the by-product oven was used increasingly as the war demand for benzol and toluol from the gases made such installations profitable, and the superiority of such coke over the bee-hive oven product had been appreciated by iron and steel metallurgists, even when the supply was limited. Another fuel development of the year was the use of powdered coal in open hearth and heating furnaces of steel plants. In the open hearth the coal is blown by an air jet of considerable pressure into the outer end of the port and is surrounded by a jet of compressed air which carries it into the current of heated air rising through the regenerator. There is a direct combustion of carbon particles, which afford a large amount of radiant heat. The method was said to be economical in that it cost less to powder coal than to gasify it in a producer and that the pulverized fuel contained the entire energy of the coal as compared with 80 per cent in the gas.

An important work of the metallurgists was the study of useful high-grade ores derived by concentrating unusable rocks. This tending

towards concentration and ore treatment of materials before putting them through the blast furnace was one that seemed to promise considerable importance for the iron industry as in the case of the more valuable metals.

In connection with blast furnaces it was interesting to note that by the use of more efficient boilers and turbines for power, the supremacy of the gas engine was being questioned for power purposes.

The duplex process where the pig iron is first treated in an acid Bessemer converter and then in a basic open hearth furnace made continued gains during 1916, and it was stated that the larger works in the future would produce most of their steel by duplex working. The severe requirements of the war specifications were responsible for attempts to improve the casting of steel ingots and reduce the losses from piping, segregation, etc., which in some plants were said to have cut down the merchantable product to 50 per cent or less. This matter, it will be recalled, figured in rail making and the shell rounds for the European nations were held up to a high standard.

In steel making special alloy steels were in demand, especially for motor vehicles, and an interesting development was a large plant with two blast furnaces whose output would go directly into finished castings by some special process that was not revealed.

While railway rails occupied a subordinate position in steel manufacture, the discussion of the various metallurgical problems involved in their making continued. Rails of 120 pounds were beginning to be used as compared with 56 pound rails 40 years earlier, but in this interval, while the weight of the rail had little more than doubled, the loads had increased from four to six times and the train speeds had more than doubled. The main difficulty was the presence of transverse fissures which could not be detected until failure and a train wreck resulted. The cause of this trouble was a matter of controversy between railway engineers and steel works metallurgists. The former tried to assert it was due to bad mill practice and the latter that it resulted from a plastic flow of the steel in the head of the rail due to the tremendous and concentrated loads directly impressed from the wheels.

**FERRO-ALLOYS.** In 1916 there was an increased amount of various alloys used in high-speed tool steel. Claims of great advantages were made for uranium steel, while vanadium steel continued in demand on account of its elasticity and shock-resisting qualities. There were no striking innovations in the metallurgy of ferro-alloys or new alloys developed. New plants were started and the capacities of many existing works increased, notwithstanding which the product was maintained at high quality and was eagerly availed of, as exports were forbidden from Europe. American metallurgists were successful in working up either native ores or, where they could be obtained from foreign sources, turning out a product in no way inferior to that previously imported. Munitions steel required considerable ferrosilicon and this was made electrically at Niagara Falls, where one calcium carbide plant was devoted to the production of ferrosilicon, and at Keokuk, Iowa. In addition to supplying domestic demand, a small amount of ferrosilicon was

exported. The annual production was estimated at 45,000 tons. Ferromanganese was being increasingly made in the United States, as was also the case with ferrovandium. Some of these alloy materials were obtained by the Goldschmidt Thermit process, but most of them were produced in the electric furnace. Ferrochrome was being made in the electric furnace for the steel industry in large part from foreign ore held in the United States, and an adequate supply of ferro-tungsten was produced for domestic needs with a surplus for export. Ferro-titanium was produced at Niagara Falls, and also there was manufactured ferromolybdenum for export, its purpose being stated to be for the lining of big guns.

**ELECTRO-METALLURGY.** The growth of the electric steel industry in 1916 was remarkable, and most of all in the United States. There was an increase of 63 furnaces during the year, or 46.3 per cent, and in Canada an increase of 11. The detailed statistics and the types of the furnaces as compiled by the *Iron Age* (New York) are shown in the accompanying table. It will appear that the Heroult furnace led not only in Europe but also in the United States and Canada, and in the latter countries the installations for the year were mainly for tool and special steel plants, five for seamless tubes, and only nine for steel casting, a purpose for which in 1915 most of these units were installed. At the Illinois Steel Company at South Chicago, two new 20-ton furnaces were being installed and with the two 15-ton furnaces in operation would form the largest electric steel plant in the world. Furnaces other than the Heroult, especially the Snyder, were installed in the United States, working not only to make electric steel but ferro- and other alloys.

In Great Britain there was also great progress in the electric steel industry and on Dec. 31, 1916, there were 88 electric furnaces as compared with 46 at the beginning of the year. Many of these naturally were installed in munitions plants. A new type of furnace, the Greaves-Etchells, was brought out in England in 1916 and before the end of the year some 20 were installed or contracted for. It was specially designed for Sheffield steel and used three-phase current. The other countries of Europe also reported increased numbers, as indicated by the table, but the figures for Germany are considered inadequate, as the electric steel output at the end of the year was estimated at the rate of nearly 200,000 tons as compared with 130,000 tons in 1915 and 90,000 tons in 1914. In Germany in 1916 there was twice as much electric furnace steel as that produced in the crucible.

Reference already has been made to electrolytic methods in the refining of copper and to new plants for the electrolytic refining of zinc ore. Bolivian tin ores were smelted and electrolytically refined at Perth Amboy, N. J., by the American Smelting and Refining Company, with a success that seemed to warrant the enlargement of the plant.

In 1916 the American aluminum industry gained and new plants and extensions were under way, so that a record production was secured which surpassed that of European countries. The imports into the United States fell off to about one-tenth of normal and the exports doubled. By 1925 it was estimated that aluminum measured by weight would be third in

TABLE OF TYPES OF ELECTRIC FURNACES BY COUNTRIES OF THE WORLD OPERATING OR CONTRACTED FOR ON JAN. 1, 1917, WITH TOTALS FOR 1916, 1915, 1913 AND 1910

From the Iron Age

	Heroult	Girod	Induction	Stassano	Keller	Chapelet	Nathusius	Snyder	Wge	Rennerfeldt	Grönwall-Dixon *	Greene	Special	Greaves-Etchells	Total Jan. 1, 1917	Total Jan. 1, 1916	Total Jan. 1, 1915	Total July 1, 1913	Total March, 1910
Germany and Luxemburg	19	5	19	2	2	3	4								52	53	46	34	30
Austria-Hungary	10	3	3	2	2					1					18	18	18	10	10
Switzerland	1	2													4	4	4	2	2
Italy	4	2	2	13	5	5				1					29	22	22	20	12
France	19	7	2							1					29	21	17	13	23
Great Britain	34	1	2	4				6		7	14			20	88	46	16	16	7
Belgium	2	1		2						7					3	3	3	3	3
Russia	3	1	1							34	23				16	11	9	4	2
Sweden	3		2							6					40	23	18	6	5
Norway			1						1						9	6	2	3	
Spain			1								1				2	2	1	1	
Japan	1	1													2	1	1	1	
Mexico			1												1	1	1	4	3
Australia											1				1	1	1		
Chile															1	1			
Rumania	1														1				
Location not given			12										9		21	9	12		
Total outside the United States and Canada	97	19	47	23	8	5	4	6	1	57	20		9	20	816	222	170	118	101
United States	79	4	3	1				19	1	13	8	1	7		136	73	41	19	10
Canada	5							3			1		10		19	8	2	3	3
Total in the United States and Canada	84	4	3	1				22	1	13	9	1	17		155	81	43	22	13
Grand total in the world	181	23	50	24	8	5	4	28	2	70	29	1	26	20	471	308	213	140	114

\* Electric-Metals in Great Britain.

importance among the metals of the world, exceeded only by copper and iron.

**Bibliography.** Among the more important books on metallurgy published in 1916 were the following: George L. Heath, *The Analysis of Copper and Its Ores and Alloys*; Theodore J. Hoover, *Concentrating Ores by Flotation*, third edition; Henry Marion Howe, *The Metallurgy of Steel and Cast Iron*; Fred Ibbotson and Leslie Atchison, *The Analysis of Nonferrous Alloys*; Donald M. Liddell, *The Metallurgists and Chemists' Handbook*; Herbert A. Megraw, *The Flotation Process*; T. A. Rickard (editor), *The Flotation Process*; Albert Sauver, *The Metallurgy and Heat Treatment of Iron and Steel*, second edition, revised and enlarged.

See CHEMISTRY, INDUSTRIAL, section under *Metals*; and articles on separate metals, as GOLD, SILVER, etc.

**METALS.** See CHEMISTRY, INDUSTRIAL.

**METAPHYSICS.** See PHILOSOPHY.

**METCHNIKOFF, ELIE.** A French bacteriologist, died in Paris July 15, 1916. He was born in the Province of Kharkov, Russia, May 15, 1845, his father an army officer, his mother a Polish Jewess. His education was obtained at the University of Kharkov, at Giessen, Göttingen, and Munich, and at Naples. From 1870 to 1882, when he resigned to devote himself wholly to research, he held the chair of zoölogy at Odessa. His theory of phagocytes or "microbe eaters" attracted the widest attention when it was advanced in his paper on "Intracellular Digestion," and led to important conclusions with regard to immunization effected by the white blood corpuscles. Metchnikoff returned again to Russia, from Messina, but soon settled in Paris, where he became identified with the work of the Pasteur Institute. By 1888 Pasteur had set aside a laboratory for his use, and

since 1904 he had been sub-director of the Institute, under Roux. Upon taking up his residence in Paris, he became a French citizen. The subject to which perhaps he devoted most attention, and which made him famous, was the prolongation of life. In the region about his early home, and especially in Bulgaria, a remarkable number of persons live to be centenarians. It was Metchnikoff's theory, put forth in 1909, that the soured milk to which these people are accustomed as a principal article of diet contained bacilli which retarded or counteracted the intestinal putrefaction and autointoxication which seemed to be responsible for senility. It was his belief that it should be possible for persons who had no organic disease to live to be 150. He held, however, that man's body was not yet "ready" for his brain, which, in his opinion, had originally been a freak anthropoid ape development. In particular he believed that the large intestine was a useless organ. He himself died of heart disease at 71. Metchnikoff also made researches into typhoid fever, cancer, diabetes, anthrax, cholera, plague, comparative pathology of inflammation, and immunity in infectious diseases. In 1912 he announced the discovery of microbes, to be found only in the intestines of the dog, which he called "glycobacteria," and which he said were so needed in the large intestine of man that inoculation with them, in his opinion, would go farther to prolong life than even the lactic acids. With Prof. Paul Ehrlich he divided the Nobel prize for medicine in 1908, devoting the amount thus received to the cause of science. Metchnikoff had been the first, in 1903, to reproduce syphilis in a lower animal (the chimpanzee), and this was the basis for important researches by other scientists. Among these was Ehrlich, who discovered



a remedy for the disease in salvarsan. Metchnikoff's books which have been published in English translations include: *Lectures on the Comparative Pathology of Inflammation*; *Immunity in Infectious Diseases*; *The New Hygiene*; *The Nature of Man*; and *The Prolongation of Life*.

**METEOROLOGY.** The death roll for 1916 includes the names of Prof. Cleveland Abbe (q.v.), chief meteorologist of the United States Weather Bureau; Prince Boris Galitzin, director of the Meteorological Service of Russia since 1913; Henrik Mohn, founder and director of the Norwegian Meteorological Service from 1866 until his retirement in 1913; and Dr. Robert H. Scott, for many years head of the British Meteorological Office.

**SLEET.** Many of the terms used in meteorology are also in common colloquial use, and have acquired such a diversity of meanings that it is of the utmost importance that they should be defined with precision. Among them are the terms sleet, ice storm, glazed ice, and others of a similar nature. Of these none perhaps has been used more loosely in the United States than the first. Accordingly, the United States Weather Bureau appointed a committee to formulate suggestions for an appropriate nomenclature of sleet. After a careful examination into the etymology of the word, its early and more recent definitions, and its usage by meteorologists, the committee decided that the fundamental confusion of usage in the United States arose from the application of the term to two forms of frozen precipitation, one of which is frozen in the free air, and the other after contact with chilled terrestrial objects, and it recommended that the term sleet should be confined to the former, while the latter should be designated as "glaze." The practice of using the term ice storm to designate the icy coating instead of the general weather conditions causing it was strongly disapproved.

**METEOROLOGY OF THE MOON.** During the nineteenth century the prevailing belief concerning the moon was that it was a dead planet showing absolutely no change in any of its features. Many selenographers, however, have never held this view, and Prof. W. H. Pickering, in an interesting article in the *Monthly Weather Review* for February, 1916, gave an explanation of certain periodic changes which had been known for some time to occur in connection with some of the more prominent features of the lunar landscape. Certain white patches visible on some of the lunar mountains were attributed to the presence of snow. These occur not in the ravines, as is usually the case on our own planet, but on the ridges of the mountain slopes. Professor Pickering suggested that cracks exist along the crests of the ridges from which water vapor escapes, and that, owing to the deficiency of the lunar atmosphere, this vapor is immediately deposited as snow. Occasional haziness in the outlines and details of certain otherwise clearly defined patches was explained as being due to snowstorms. The increase and decrease in the size of the patches were shown to be intimately connected with the lunar phase.

**COST OF BAD WEATHER.** Prof. C. F. Talman, in an article in the *Mentor*, gave some figures showing the cost of bad weather in various countries. It was estimated that a difference of one inch in the July rainfall of the principal

corn-growing States of the Union meant a difference of \$250,000,000 in the value of the crop. The world's damage caused by hailstorms amounts to almost the same, and bad weather in the British Isles is responsible for a loss of \$100,000,000 to the farmers.

**CLIMATIC CORRELATIONS.** Evidence continued to accumulate concerning the interdependence of the weather conditions in widely separated regions of the earth. Mossman found a distinct see-saw of pressure, temperature, and wind velocity between Ross Sea in the Antarctic and stations in the South Orkneys and Graham Land, the former situated in latitude 78° south and longitude 165° east, and the latter in latitude 60° south and longitude 50° west. The seasonal departures from the normals of pressure and wind velocity were found to be of opposite signs, but in the case of the temperature this opposition was only strikingly evident in winter. H. Helm Clayton found a correlation between the average rainfall of the United States between the 80th and 110th meridians and that of central South America, as indicated by the overflow of the River Parana, while both showed an inverse correlation with the Australian rainfall. A similar correlation of temperature had previously been found from observations made at stations in Central Argentina and Central Australia. Okada furnished evidence of the remarkable relation existing between the pulsations of the Siberian anticyclone and the anomalous behavior of the air temperature on the east coast of Japan, a decline in the intensity of the anticyclone in March being associated with a fall of the mean air temperature of the latter region during the following July and August.

**PROGRESSIVE CHANGE OF EUROPEAN CLIMATE.** The theories of Huntington and Kropotkin regarding the progressive aridation of the earth were examined by Hildebrandsson in the light of the evidence afforded by European historians, and particularly by those of the Scandinavian countries. He arrived at the conclusion that, while evidence of climatic variations of long and short duration could be found everywhere, it was impossible to prove that the European climate had changed for better or worse during the historic period.

**METEOROLOGY AND THE WAR.** The meteorological establishments of the belligerent countries have been called upon to an unprecedented degree in connection with the war. Owing to the interruption of communications between the various nations at war, the issuing of ordinary meteorological forecasts was more or less suspended, but the services of meteorological experts were enlisted for the benefit of the armies in the field. Weather forecasts in connection with both military and naval operations assumed a new significance, and a knowledge of the behavior of the upper air was found essential for the information of the flying services, while the conditions of the surface atmosphere have played an important part in artillery operations in connection with gun-sighting and range-finding.

**OTHER EVENTS.** The Marcellus Hartley gold medal of the National Academy of Sciences for eminence in the application of science to the public welfare was awarded to Prof. Cleveland Abbe in consideration of his distinguished service in inaugurating systematic meteorological observations in the United States.

**METHODIST BROTHERHOOD.** As a result of the action of the general conference of the Methodist Episcopal Church in 1916, the Methodist Brotherhood no longer exists as a distinct connectional organization. The Board of Sunday Schools takes over the responsibility of promoting all men's organizations within the Church, including the brotherhood, but the latter as a local organization to be established in connection with any given church remains intact. The Board of Sunday Schools agrees to provide chapters of the brotherhood with literature, emblems, charters, and such supplies as they may require. The adult department of the Board of Sunday Schools has direct charge of the different forms of men's organizations established within the Church. Two advantages result from this change by the general conference. The first is, that a single board of the Church directs the enlisting and organization of the men of the churches and communities. The Church is relieved of duplications, embarrassing parallel movements, and unnecessary expense. The second is, the local church is charged with the responsibility of determining the particular form its organization of men shall take. The purpose now is to have every Bible class of men embody in its programme social and fraternal activities such as characterize the brotherhoods, and to have every brotherhood organization emphasize Bible study and activities of worship such as characterize Bible class organization. In 1916 there were enrolled in the men's Bible class and brotherhood organizations about 500,000 men.

**METHODIST EPISCOPAL CHURCH.** The total number in full membership in this denomination in 1916 was 3,723,361, with 407,976 probationers, 30,738 churches, 18,883 ministers in full connection, 1621 on trial, and 15,239 local preachers. This represents a gain of 100,891 in full membership over 1915, of 84 in churches, and of 117 in ministers in full connection. The average salary of pastors in 1916 was \$996.52. The total membership, including probationers, in 1916 was 4,131,337, a gain of 103,173 over the corresponding figures for 1915. The total number of Sunday schools in 1916 was 36,121, with 408,244 officers and teachers, an increase of 2815 over 1915. The Sunday school pupils in 1916 numbered 4,579,029, an increase of 81,565 over 1915. The total membership of the Epworth League in 1916 was 830,889. The estimated value of church property in 1916 was \$217,646,570, an increase of \$5,321,102 over 1915; and of parsonages \$36,174,635, an increase of \$964,118 over 1915.

The missionary activities of the denomination are conducted through the Board of Foreign Missions, the Board of Home Missions and Church Extension, the Woman's Foreign Missionary Society, and the Woman's Home Missionary Society. The mission conferences of the denomination are: Austria-Hungary, Bulgaria, Burma, France, Inhambane, Kiangsi, North Africa, North Andes, Pacific Swedish, Porto Rico, Rhodesia, Southern Swedish, West Central Africa, and West China. Extensive missions are maintained on four continents, as follows: Asia: India, Burma, Malaysia, the Philippine Islands, Java, Borneo and Samatra, China, Japan, and Korea; Africa: Liberia, Angola, Madeira Islands, Southern Congo, Portuguese East Africa, Rhodesia, Algeria, and

Tunis; South America: Argentina, Paraguay, Uruguay, Bolivia, Chile, Peru, and Panama; Europe: The Board of Foreign Missions maintains mission organizations in Italy, France, Bulgaria, Austria-Hungary, and Russia, and makes grants in aid to the Methodist Episcopal conferences in Germany, Switzerland, Denmark, Norway, Sweden, and Finland. Thus in all 34 different countries are benefited, and the gospel is preached in about twice that number of languages. In 1916 the total number of foreign missionaries was 1539, assisted by 11,422 native workers, and an enrolled membership of 429,235, besides baptized children and unbaptized adherents, making a total of 661,306, a net gain of 25,911 over 1915. In 1916 the receipts of the Board of Foreign Missions were \$1,933,256; Board of Home Missions and Church Extension, \$1,145,029; Woman's Foreign Missionary Society, \$1,033,770; Woman's Home Missionary Society, \$991,236.

Under the general charge of the Board of Education are maintained in the United States and abroad 420 educational institutions, including 42 colleges and universities, of which the most important are De Pauw University, Indiana; Northwestern University, Illinois; University of Southern California; Ohio Wesleyan University; Boston University; and Wesleyan University. There are 10 theological schools for white students and six for colored.

Besides the missionary and Sunday school organizations and the Board of Education, there are: the Methodist Book Concern, through which the publications of the denomination are issued; the Epworth League, the association for the young people of the Church; the Methodist Federation for Social Service; the Freedman's Aid Society; the Deaconess Work; and the Temperance Society. The bishops chosen in 1916 were: William F. Oldham; Charles Bayard Mitchell; Franklin Hamilton; Matthew Simpson Hughes; Thomas Nicholson; Herbert Welch; Adna W. Leonard.

**METHODIST EPISCOPAL CHURCH, SOUTH.** The larger number of Methodists in the Southern States are included in this denomination. According to official returns there were at the beginning of 1916, 2,102,065 members, including local preachers, a gain of 66,418 over 1915. There were in 1916, 7440 traveling preachers, not including supplies, a gain of 116 over 1915; 147,155 Sunday school officers and teachers, an increase of 7354 over 1915; 1,697,163 Sunday school scholars, an increase of 115,692 over 1915; 133,063 Epworth League members, an increase of 9055 over 1915; 17,232 churches, an increase of 151 over 1915; value of churches, \$59,050,201, an increase of \$1,372,293 over 1915; number of parsonages, 5418, an increase of 50 over 1915; value of parsonages, \$11,420,296, an increase of \$292,751 over 1915.

The work of the denomination extends over territory in which there are 330 districts and 50 conferences, including the missionary conferences of Brazil, Central Mexico, China, Cuba, German Mission, Korea, Mexican Border Mission, and South Brazil. The total salaries for the preachers in charge amounted in 1915 to \$4,795,841, the average ministerial salary being \$772. The total expenditure for benevolent purposes, not including gifts for endowments and buildings for colleges, was \$1,449,710 in 1915, or 70.3 cents per capita.

In 1916 there were 12 active and two superannuated members constituting the board of bishops. The official headquarters of the Church are in Nashville, Tenn., where the publication interests are located. Twenty Wesley houses, which are social settlements for the whites, are in charge of and maintained by a committee of the Women's Missionary Council. There are three Bethlehem houses for the negroes. About 50 deaconesses give their entire time to social service. The next general conference will be held in May, 1918.

**METHODISTS, BRITISH.** The Methodist Publishing House of London has published the following statistics of British Methodism for 1916. They contain not only the returns for Great Britain and Ireland, but Methodist churches and missions in foreign fields. The returns for Canadian Methodism will be found in a separate article. British Methodists at home and abroad had in 1916 a total of 10,356 ministers; 64,469 lay preachers; 1,804,890 church members and probationers; 25,803 Sunday schools; 308,731 Sunday school officers and teachers; 2,522,793 Sunday school scholars; and 25,961 churches, etc. The churches, etc., for Great Britain are not included in the last mentioned total, but their seating capacity is given as 2,378,356.

**WESLEYAN METHODISTS.** This is the largest branch of the denomination in Great Britain and Ireland. In 1916 it had 2855 ministers; 19,910 lay preachers; 522,764 church members and probationers; 7814 Sunday schools; 127,541 Sunday school officers and teachers; 917,328 Sunday school scholars. Of this total Great Britain had 2603 ministers; 19,211 lay preachers; 494,993 church members and probationers; 7478 Sunday schools; 125,231 Sunday school officers and teachers; 893,527 Sunday school scholars. In Ireland in 1916 the Wesleyan Methodists had 252 ministers; 699 lay preachers; 27,771 church members and probationers; 336 Sunday schools; 2310 Sunday school officers and teachers; 23,801 Sunday school scholars; 547 churches, etc. In foreign missions the Wesleyan Methodists in 1916 had 735 ministers; 6128 lay preachers; 183,231 church members and probationers; 2182 Sunday schools; 8752 Sunday school officers and teachers; 134,059 Sunday school scholars; and 3538 churches, etc. In the French Conference of Wesleyan Methodists in 1916 there were 35 ministers; 84 lay preachers; 1733 church members and probationers; 36 Sunday schools; 163 Sunday school officers and teachers; 2251 Sunday school scholars; and 131 churches, etc. In the South African Conference the Wesleyan Methodists in 1916 had 282 ministers; 4407 lay preachers; 139,161 church members and probationers; 890 Sunday schools; 3133 Sunday school officers and teachers; 42,223 Sunday school scholars; and 4160 churches, etc.

**PRIMITIVE METHODISTS.** Ministers in 1916, 1157; lay preachers, 15,336; church members and probationers, 205,323; Sunday schools, 4172; Sunday school officers and teachers, 56,428; Sunday school scholars, 436,077; churches, etc., 4807.

**UNITED METHODIST CHURCH.** Ministers in 1916, 812; lay preachers, 6095; church members and probationers, 183,431; Sunday schools, 2272; Sunday school officers and teachers, 39,842; Sunday school scholars, 287,887; churches, etc., 3029.

**WESLEYAN REFORM UNION.** Ministers in 1916, 25; lay preachers, 489; church members and probationers, 8810; Sunday schools, 197; Sunday school officers and teachers, 2633; Sunday school scholars, 23,394; churches, etc., 213.

**INDEPENDENT METHODIST CHURCHES.** Ministers, 402; church members and probationers, 9068; Sunday schools, 160; Sunday school officers and teachers, 3070; Sunday school scholars, 26,551; churches, etc., 147.

**AUSTRALIAN METHODIST CHURCH.** Ministers, 985; lay preachers, 8634; church members and probationers, 149,878; Sunday schools, 3849; Sunday school officers and teachers, 21,964; Sunday school scholars, 203,365; churches, etc., 5147.

**NEW ZEALAND METHODIST CHURCH.** Ministers, 198; lay preachers, 946; church members and probationers, 24,730; Sunday schools, 407; Sunday school officers and teachers, 3276; Sunday school scholars, 29,448; churches, etc., 460.

**JAPAN METHODIST CHURCH.** Ministers, 241; church members and probationers, 15,364; Sunday schools, 340; Sunday school teachers and scholars, 28,438; churches, etc., 245.

**METHODISTS, CANADIAN.** The Methodist Church in Canada was formed in 1883 by the union of the Canadian branches of the Wesleyan Methodist Church, the Methodist Episcopal Church, the Primitive Methodist Church, the Methodist New Connexion Church, and the Bible Christian Church. The territory covered by the operations of the Church includes the Dominion of Canada, Newfoundland, Bermuda, and mission fields in China and Japan. For administrative purposes there are 12 conferences: Toronto, London, Hamilton, Bay of Quinte, Montreal, Nova Scotia, New Brunswick and Prince Edward Island, Newfoundland, Manitoba, Saskatchewan, Alberta, and British Columbia.

In 1916 there was a total membership of 378,802; ministers, 2860; churches, 3782. Under the educational control of the Church are 17 colleges and universities, of which the most important are: Victoria University, Toronto; Mount Allison University, Sackville, N. B.; Wesleyan Theological College, Montreal; Wesley College, Winnipeg. The total value of all buildings and endowments is \$7,200,391. There were in 1916 3818 Sunday schools, with 42,590 officers and teachers, and 415,337 scholars. There were 2327 Young People's Societies, with 93,530 members. The total value of church property, including churches, colleges and endowments, and parsonages, was \$43,242,261. The total missionary income for 1916 was \$661,561.

The principal officers of the Church in 1916 were: Samuel Dwight Chown, general superintendent; Albert Carwan, general superintendent emeritus; I. Albert Moore, secretary of the general conference; William Briggs, book steward; W. B. Creighton, editor of the *Christian Guardian*; A. C. Crews, editor of Sunday school publications; D. W. Johnson, editor of the *Wesleyan*.

**METHODISTS, COLORED.** In 1916 there were 341,783 colored members of the Methodist Episcopal Church. The Colored Methodist Episcopal Church, an offshoot of the Methodist Episcopal Church, South, had, according to the latest official figures available, 3072 ministers, 3196

churches, and 240,798 members. The African Methodist Episcopal Church, which was formed from the Methodist Episcopal Church in 1815, had, according to the latest statistics obtainable, 5000 ministers, 6000 churches, and 620,000 members. The African Methodist Episcopal Zion Church, organized in 1821, had, according to the latest obtainable returns, 3552 ministers, 3180 churches, and 568,608 members. The Union American Methodist Episcopal Church (Colored) had 170 ministers, 212 churches, and 19,000 members. The African Union Methodist Protestant Church (Colored) had 200 ministers, 125 churches, and 4000 members. The Reformed Zion Union Apostolic Church (Colored) had, in 1906, 33 ministers, 45 churches, and 3059 members. The Reformed Methodist Union Episcopal Church (Colored) had 72 ministers, 58 churches, and 4397 members.

**METRIC SYSTEM.** See WEIGHTS AND MEASURES.

**METROPOLIS BRIDGE.** See BRIDGES.

**METROPOLITAN MUSEUM OF ART.** See ARCHAEOLOGY; GIFTS AND BEQUESTS; PAINTING AND SCULPTURE.

**METROPOLITAN OPERA HOUSE.** See MUSIC, sections *Opera* and *Ballet*.

**MEUSE, BATTLE OF THE.** See WAR OF THE NATIONS.

**MEXICO.** A federal republic situated between the United States and Central America. It is called officially both *Estados Unidos Mexicanos* and *República Mexicana*. The capital city is Mexico, in the Federal District; but on Feb. 14, 1916, the *de facto* (Constitutionalist) government declared Querétaro the provisional capital. During 1916 unsettled and in large part chaotic conditions continued in the industrial, commercial, and administrative activities of the republic. As in the preceding year, very little authoritative statistical information was available.

**AREA AND POPULATION.** The area of Mexico is stated at 1,987,201 square kilometers (767,258 square miles). The census of Oct. 27, 1910, returned a population of 15,160,369, as compared with 13,607,259 in 1900. In 1900, pure whites, and nearly pure, constituted about 19 per cent of the population; persons of mixed white and Indian blood, about 43 per cent; Indians, about 38 per cent. In 1910, males numbered 7,504,471, and females 7,655,848. Spanish-speaking persons in 1910 numbered 13,143,372; most of the remaining inhabitants spoke Indian languages, as Nahuatl (516,410), Maya (227,883), Zapoteco (224,863), Otomi (209,640), Mixe (166,157). Persons of Mexican-birth numbered 15,043,842; persons of foreign birth, 116,527, as follows: Spanish, 29,541; Guatemalan, 21,434; American, 20,639; Chinese, 13,203; British, 5264; French, 4604; German, 3827; Cuban, 3418; Turkish, 2907; Italian, 2595; Japanese, 2216; other, 6979.

According to the 1910 census, Roman Catholics numbered 15,033,176; Protestants, 68,839; adherents of the Orthodox Church, 630; Mohammedans, 602; Buddhists, 6237; Jews, 254; other religious adherents, 5605; without religion, 25,011; unknown, 20,015.

The area by states and the population according to the census of 1910 and an estimate of 1912, together with approximate density per square kilometer in 1912, are shown in the following table:

States	Sq. km.	Pop. 1910	Pop. 1912
Aguascalientes	7,692	120,511	124,497
Baja California *	151,109	52,272	58,254
Campeche	46,855	86,661	86,685
Coahuila	165,219	362,092	376,747
Colima	5,887	77,704	80,500
Chiapas	71,302	438,843	456,371
Chihuahua	238,214	405,707	423,387
Distrito Federal †	1,499	720,753	763,170
Durango	109,495	483,175	509,586
Guanajuato	28,363	1,081,651	1,085,681
Guerrero	65,480	594,278	620,416
Hidalgo	22,873	646,551	655,187
Jalisco	86,752	1,208,855	1,220,160
México	23,909	989,510	1,000,903
Michoacán	58,594	991,880	1,008,491
Morelos	4,911	179,594	183,705
Nuevo León	64,888	365,150	373,307
Oaxaca	92,443	1,040,398	1,059,789
Puebla	38,653	1,101,600	1,118,489
Querétaro	11,638	244,668	247,195
Quintana Roo *	49,914	9,109	9,328
San Luis Potosí	62,177	627,800	638,832
Sinaloa	71,380	323,642	329,181
Sonora	198,496	265,888	275,107
Tabasco	26,871	187,574	192,675
Tamaulipas	79,861	249,641	258,278
Tepec ‡	28,371	171,173	175,731
Tlaxcala	8,974	184,171	186,634
Veracruz	72,216	1,132,859	1,165,934
Yucatán	41,287	339,613	347,781
Zacatecas	63,366	477,556	480,690
Total	1,987,201 †	15,160,369	15,501,684

\* Territory. † Federal District. ‡ Including islands, 4042 sq. km.

Population of the larger cities at the 1910 census: Mexico, 471,066; Guadalajara, 119,468; Puebla, 96,121; Monterrey, 78,528; San Luis Potosí, 68,022; Mérida, 62,447; León, 57,722; Veracruz, 48,633; Aguascalientes, 45,198; Morelia, 40,042; Chihuahua, 39,706; Pachuca, 39,009; Oaxaca, 38,011; Guanajuato, 35,682; Saltillo, 35,414; Orizaba, 35,263; Torreón, 34,271; Querétaro, 33,062; Durango, 31,763.

Complete separation of church and state has existed in Mexico since 1859. Although the 1910 census returned about 97 per cent of the people as Roman Catholic, large numbers have drifted away from the practical influence of the Church or even become antagonistic to it. Neither the leaders of the Constitutionalist government nor their opponents in the civil wars of recent years have appeared to be in sympathy with the Church. In the *Bulletin* of the Pan-American Union for May, 1916, it was stated that a divorce law recently promulgated allows the dissolution of marriage, three years after consummation, by the mutual consent of the husband and wife and permits the remarriage of the divorcees.

**INDUSTRIES.** According to reports current during 1916, there was in general no considerable return to normal industrial conditions. Even before the devastating civil wars agricultural production, in proportion to the country's capabilities, was small. There are vast areas of fertile soil and much other land that can profitably be made fertile by irrigation. But the existence of enormous estates used unadvantageously for grazing, the difficulty in obtaining small holdings, and the primitive methods of cultivation retarded agricultural progress. Agrarian conditions are one of the chief causes of the popular discontent that has made possible the civil wars. In time of peace, however, Mexico has produced large quantities of corn, beans, sugar cane, coffee, and (in the south) sisal hemp. More than either agricultural or stock raising, development of the exceptionally

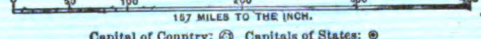






# MEXICO.

SCALE OF STATUTE MILES.



157 MILES TO THE INCH.

Capital of Country: Capitals of States:

Railroads: Finished Proposed

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rich mineral resources has attracted foreign capital and contributed to such economic prosperity as the country enjoyed under the presidency of Porfirio Diaz. In the year 1911-12 the total value of the mineral output was over 209,700,000 pesos; gold production amounted to 1,173,957 ounces, and silver 80,205,670. In the 35 years from 1877-78 to 1911-12, the gold output totaled 395,904.7 kilograms, valued at 527,871,760 pesos; the silver output, 49,600,726.5 kilograms, valued at 1,973,394,124 pesos; total value of gold and silver, 2,501,265,884 pesos. In 1916 large deposits of manganese were reported from Lower California. The development of the Mexican petroleum industry, which centres in the Tampico region and the Isthmus of Tehuantepec, has been very rapid during the last 10 years. The output increased from about 1,000,000 barrels in 1907 to 26,235,403 barrels in 1914 and about 35,010,000 barrels in 1915. Manufactured asphalt and residual pitch from Mexican petroleum reached a total export tonnage estimated at 388,318 in 1915, with a value of \$3,730,436.

In the autumn of 1916 was published a list of foreign investments in Mexico; the total was \$1,641,054,180, composed as follows: American capital, \$1,057,770,000; English, \$321,302,800; French, \$143,446,000; various, \$118,535,380. In addition, Mexican investments in the same enterprises were estimated at \$793,237,242, making a grand total of \$2,434,291,422. The largest amounts of American money were invested as follows: railway shares and bonds, \$644,390,000; mines, \$223,000,000; domestic bonds, \$52,000,000; smelters, \$26,500,000; bank deposits, \$22,700,000; petroleum, \$15,000,000; rubber, \$15,000,000; factories, \$9,600,000. English investments included: railway shares and bonds, \$168,917,800; domestic bonds, \$67,000,000; bank deposits, \$43,600,000; woodlands, \$10,300,000.

COMMERCE. Commercial statistics for the years 1914 and 1915 are not available. An estimate published in the *Bulletin* of the Pan-American Union for November, 1916, placed the total import value in 1914 at \$78,000,000 and in 1915 at \$85,000,000; export value in 1914, \$165,000,000, and in 1915, \$156,000,000. In the fiscal year 1910-11, imports were valued at \$102,937,000, and exports at \$146,877,000; 1911-12, \$91,331,000 and \$148,995,000; 1912-13, \$97,886,000 and \$150,203,000.

The 1912-13 export value in pesos was 300,416,000. The more important items composing this figure were, in thousands: Silver, 91,287; gold, 39,596; copper, 36,522; sisal hemp, 30,133; coffee, 11,263; hides, 11,162; beans, 8417; rubber, 8363; live animals, 7556; guayule, 6238; chicle, 4930; lead, 4907; chick-peas, 4349; ixtle, 3646; woods, 3365; vanilla, 3815.

Trade by countries, in thousands of dollars American:

	Imports		Exports	
	1911-12	1912-13	1911-12	1912-13
United States.....	49,213	48,644	112,730	116,018
United Kingdom...	10,753	12,950	20,099	15,574
Germany.....	11,923	12,610	5,158	8,219
France.....	7,809	9,169	4,165	3,576
Spain.....	2,950	5,265	1,180	1,091
Belgium.....	1,640	1,402	3,177	2,576
Total, including others.....	91,331	97,886	148,995	150,203

In the following table are given estimates from the *Bulletin* of the Pan-American Union of November, 1916, in thousands of dollars American, of the trade by countries in 1914 and 1915:

	Imports		Exports	
	1914	1915	1914	1915
United States.....	*33,216	*41,071	†86,281	†83,552
United Kingdom...	10,000	12,000	35,000	30,000
France.....	7,200	7,000	5,800	5,000
Germany.....	11,200	450	9,000	100

\* American exports to Mexico. † American imports from Mexico.

COMMUNICATIONS. The length of railway in operation on Sept. 30, 1913, was 25,398 kilometers (15,782 miles), as compared with 25,287 kilometers (15,713 miles) on Sept. 30, 1912. No new construction was reported for 1914, and only about 35 miles for 1915, while a great extent of line was damaged or destroyed in the course of the civil war. Nearly 79 per cent of the railway is under control of the Federal government. The first section of the Cuzco-Santa Ana Railway, extending 20 miles to the village of Poroy, was opened on October 22nd. The Federal telegraph, as reported for 1913, comprised 94,512 kilometers (58,727 miles), with 516 offices; other telegraphs, 8387 kilometers (5211 miles). Radiotelegraph stations, 24. Some activity in radiotelegraph installation was reported in 1916. Post offices (1913), 2911.

FINANCE. The monetary unit is the silver peso; its par value is 49.846 cents. As a result of the continued civil war metallic currency was practically withdrawn from circulation, while enormous quantities of paper money were issued. The paper peso fluctuated in value in 1915 from 2 to 8 cents. In the fiscal year 1912, the revenue of the Federal government was 105,203,087 pesos silver, and the ordinary expenditures 96,985,953 pesos silver. Most of the revenue is derived from customs and from taxes on real property. The principal expenditures are for war and the public debt. The budget for the fiscal year 1915 placed the revenue at 145,957,000 pesos silver and the expenditure at 152,204,898 pesos silver. No statistical account of Federal finances in 1916 is available. The outstanding foreign debt, as reported for Dec. 31, 1915, was £38,531,920 (including the Mexico City loan).

GOVERNMENT. Mexico is a federation of states autonomous in local affairs. Under the constitution, the president and vice-president are elected by indirect vote for six years. The president is assisted by a cabinet of eight members. The legislative power is exercised by a congress of two houses, the Senate and the Chamber of Deputies. Senators (56 in number, two from each state and the Federal District) are elected for four years, and Deputies (233) for two years, all by direct vote. The states have their own popularly elective governors and legislatures. In October, 1915, the governments of the United States, Argentina, Brazil, Bolivia, Chile, Uruguay, and Guatemala recognized Gen. Venustiano Carranza, leader of the Constitutionalists, as chief of the executive power of the de facto government of Mexico. General Carranza continued as chief executive during 1916.

## HISTORY

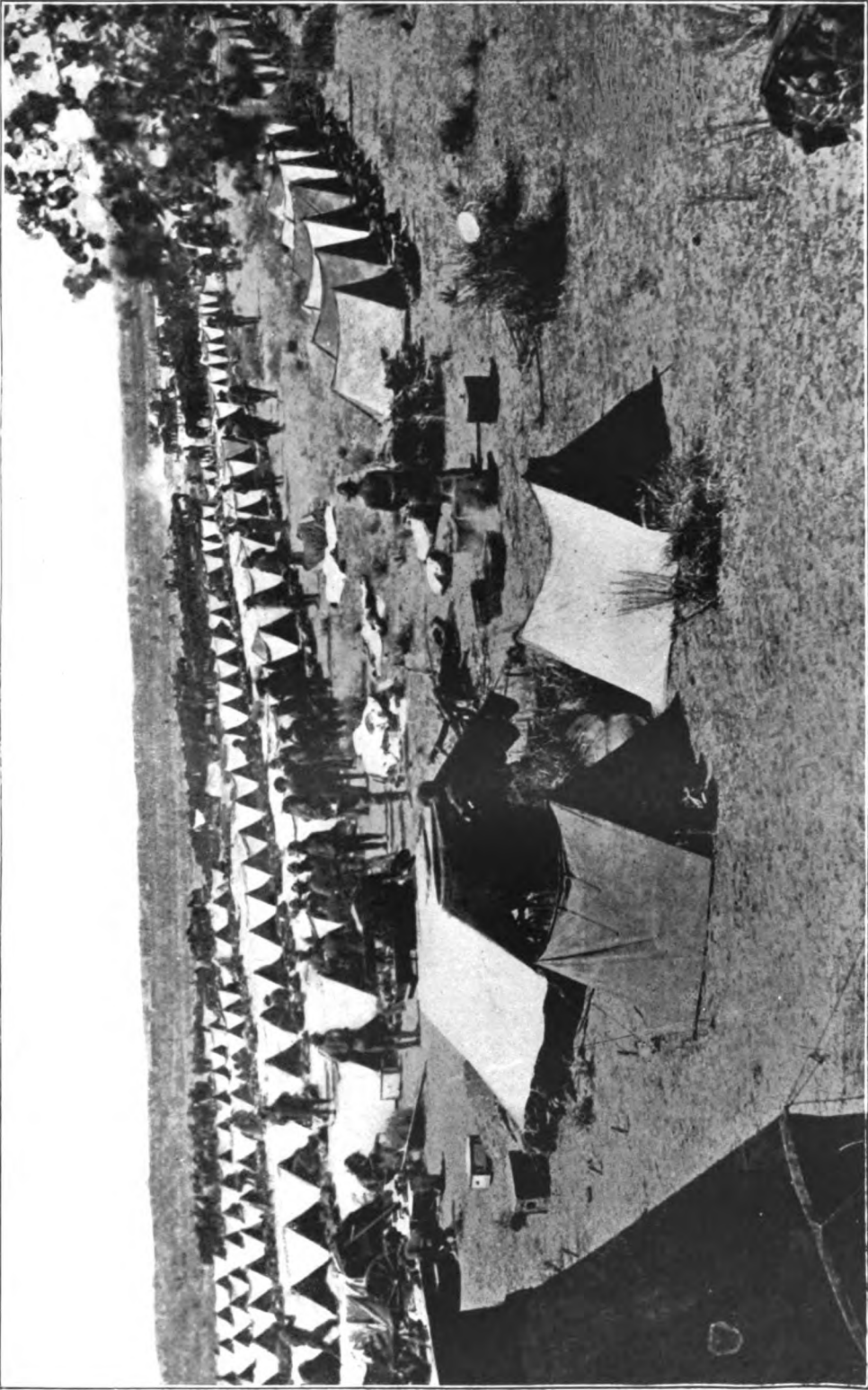
**INTERNAL CONDITIONS.** As a result of the prolonged revolution, wretched conditions were reported throughout the country early in the year. In the north the rich mines were no longer working and in wide tracts of agricultural territory, farming and animal industries had been brought to an end by the repeated attacks of bandits. The spread of typhus and great suffering from starvation were reported among the poor and there seemed little prospect of realizing the programme for the protection of life and property held out by Carranza. The long expected land reform project was postponed. The religious liberty, which he had promised to uphold, was invaded by fanatics among his own followers who persecuted the clergy, confiscated church property, and hampered the freedom of worship. It was under these conditions that Villa made his determined move against Americans with the design undoubtedly of bringing about American intervention.

**MASSACRE OF SANTA YSABEL.** In the latter part of 1915 the United States in company with other countries had recognized Carranza as the *de facto* president of Mexico. This action aroused the deepest feelings of bitterness in Francisco Villa, which, in connection with defeats of his forces by the officers of Carranza, had transformed him from a former friend of the United States to an enemy. This feeling was soon to take active form. After several weeks in which nothing had been heard of the movements of Villa and his band, suddenly news came that on January 11th he had stopped a train near Santa Ysabel, about 50 miles from the city of Chihuahua, and had taken from it a number of American citizens who, for the most part, were mine officers and engineers. The party of Americans included Charles R. Watson, the general engineer of the mines and chairman of the Chihuahua Miners' and Smelters' Association, W. J. Wallace, superintendent of the company's mines, the foreman of the mines, and the bookkeeper. In all there were 19. These men were taken from the train, stripped of their possessions and clothing, lined up before firing squads, and killed. One survivor of the massacre who escaped unobserved, brought the news to El Paso. It was claimed that this party of travelers had the assurance of the American consul at Chihuahua that it was safe to travel in the region in which they intended to go. General Carranza, at the request of Secretary Lansing, at once undertook the capture and punishment of the murderers. The offer of American troops to assist in the pursuit was refused. After several days two of Villa's officers, Almida and Rodriguez, were captured at Madera, following a fight with members of their band in which 40 were killed. Both these officers were shot. After further search other officers of Villa were captured and shot.

**DISCUSSION IN THE UNITED STATES.** The murder of these American citizens caused much feeling in Congress, which was at the time in session. In the Senate, Senator Sherman introduced a resolution which amounted to a demand for an immediate invasion of Mexico, and containing the provision that the United States should invite the six Latin-American nations which had recognized Carranza to join with the United States in demanding immediate action

by Carranza to bring about conditions of safety in Mexico. If he should fail in doing this, the United States would intervene with armed forces. Still another resolution proposed the formation of a neutral zone in Northern Mexico to be policed by American and Mexican troops. Other speeches were made in which it was urged that the time had come for laying aside the policy of "watchful waiting." Senators Lodge and Borah of the Foreign Relations Committee urged a favorable report on the resolution, saying that it would have a salutary effect on Carranza. In the House of Representatives also speeches were made denouncing the course of the Government. The leaders in Congress succeeded after a time in restoring a measure of calm and preventing action on the various resolutions, in order not to embarrass President Wilson. Senator Stone, chairman of the Committee on Foreign Relations, speaking for the President, declared that it would be monstrous for armed forces of the United States practically to make war on Mexico immediately after the recognition of Carranza without giving him time and opportunity to restore stable conditions. The only action taken by the Senate was to agree to a demand made by Senator Fall of New Mexico for information relating to Mexican conditions as they affected Americans, including reports of the Brazilian ambassador in the city of Mexico, who had been acting for American interests from the time that President Wilson broke off relations with Huerta. This information Secretary Lansing refused to furnish on the ground that it was of too confidential a nature to be made public. He did send data relating to the number of Americans who had lost their lives in Mexico. These figures showed that 76 Americans had been killed in the three years preceding Jan. 1, 1916. Of these, 24 had been killed from causes due directly to revolution, 44 by bandits, Indians, and civilians, and 8 from a railroad accident, which was a result of the disorders. From 1910 to 1912 the number of Americans killed was 47. Between 1913 and 1916, 20 American civilians, 16 American soldiers, and 62 Mexicans were killed on the American side of the border.

**THE COLUMBUS MASSACRE.** No further progress was made in the pursuit of Villa, and various reports indicated that he was still in the neighborhood of the scene of his crime. In the latter part of February he was reported to be approaching the Texas boundary, and American troops were placed in readiness to meet him. Instead of attempting to reach the border, however, he diverted his course and attacked the Carranza troops at Montezuma, south of Juarez. He again disappeared, although various reports showed him to be still within a short distance of the border. On March 9, 1916, the border town of Columbus in New Mexico was suddenly raided at night by about 1500 bandits headed by Villa. The 13th United States cavalry was stationed at this point, but the bandits succeeded in eluding them, and had reached the town before the alarm was given. The encampment was some distance from the town proper. It was evident that spies had previously informed Villa of the location of the troops. The telephone and telegraph wires were cut so that no calls for help could be sent. In addition, Villa had misled the American authorities, stating that he was in the neighborhood of Nogales.



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CAMP OF AMERICAN EXPEDITIONARY FORCE UNDER GENERAL PERSHING AT COLONA DUBLAN, MEXICO



The bandits led by Villa raided the post office and several stores, set fire to a number of houses, and shot many residents before the American troops were able to reach the scene. The greatest brutality was shown toward both men and women. Following two hours' looting and fighting the bandits succeeded in withdrawing, after having killed 11 civilians and 9 troopers. They lost 27 of their own number, including Lopez, the second in command. A body of 250 cavalymen pursued the band for five miles into Mexican territory. They succeeded in killing 40 of the bandits and lost one of their own number.

**AMERICAN PUNITIVE EXPEDITION.** This exploit aroused the greatest excitement and indignation throughout the United States. The President and his cabinet consulted and decided at once to send a punitive expedition to Mexico with or without the consent of Carranza. The latter expressed regret for the outrage to the American government, but persisted in withholding his consent for United States troopers to enter the country. So far from showing a disposition actively to aid the United States government, he in effect condoned the raids by Villa's bandits, comparing them to similar attacks made in former years by American Indians on Mexican territory. He in addition made a demand to the State Department in a note dated March 11th, for the necessary permission for Mexican forces to cross into American territory in pursuit of possible American raiders on Mexican territory. On the day following he issued a longer manifesto which amounted to refusal to permit the pursuit of Villa on Mexican soil unless reciprocal right was granted to Mexican forces. To this demand President Wilson gave assent, with the provision that the conditions calling for it must be identical. He agreed that Mexican troops might cross the international boundary to pursue "lawless bands of armed men who entered Mexico from the United States, committed outrages on Mexican soil, and fled to the United States."

Somewhat ironical was the gratification expressed by the President that Carranza had shown "so cordial and friendly a spirit of co-operation." Following this, Carranza attempted to restrict the scope of the expedition by proposed conditions that would limit the force to 1000 men composed entirely of cavalry. He consented to the use of machine guns, but suggested also that there should be no infantry or artillery employed. He added also the condition that the pursuit must not continue for more than 40 miles from the boundary line, and must be discontinued and the troops withdrawn within five days except in unusual cases. In addition to all this the pursuing forces must not cross the line within six miles of any town on the border, or occupy any city or town. Other conditions were included, the most of which were rejected by the State Department. Agreement, however, was made to the points of departure and to the non-occupation of towns. Carranza refused to acknowledge that Mexico had consented to permit the punitive expedition. The American government announced that its operation would be strictly confined to the pursuit of Villa and "in no circumstances would be suffered to infringe in any degree upon the sovereignty of Mexico or develop into intervention of any kind." The proposed expedition, it was declared, was "de-

liberately intended to preclude the possibility of intervention."

The House of Representatives by a vote of 236 to 1 supported the action of the President. This vote was taken in the passage of a resolution authorizing the increase of the army to the maximum permitted by the law. Both the House and the Senate also endorsed the official announcement of the actual object of the expedition. A joint resolution introduced in the Senate by Senator La Follette setting forth the purpose of the expedition as before outlined by the President, was unanimously passed. A similar resolution was passed in the House.

At this time there were about 19,000 American troops along the international border, and General Funston, who had command, was at once ordered to organize an expedition. The command was under Gen. J. Pershing, who was given a free hand, in capturing Villa dead or alive. Carranza was mollified by the declaration of American intentions through Congressional action, and he somewhat ungraciously ordered his troops to cooperate with the American forces. Commands were given to General Obregon, who was now minister of war, to this effect. In various cities of Mexico, however, great hostilities were shown toward Americans. There were riots at Juarez and Torreon, where the inhabitants were very favorably disposed toward Villa.

**THE AMERICAN ADVANCE: THE PARRAL INCIDENT.** The punitive expedition crossed the border on March 15th. It was composed of two columns; the larger, which consisted of about 4000 men, under the personal command of General Pershing, started from Columbus. They were accompanied by a party of Carranza's troops. The other force, which was considerably smaller, was under the command of Col. George A. Dodd. This column crossed the border some distance west of Columbus, and after a march of 60 miles reached Casas Grandes, on March 17th. Objection was made by the Mexican commander in this city to the entrance of American troops, but assurance was given from Washington that the troops would not occupy the town. This city became the base of the expedition, and three divisions of troops were sent in different directions. One went toward Lake Babicora, 70 miles south, and the other two marched for Galeana, southwest of Casas Grandes, where they separated. One division marched toward Carmen, and the other to Cruces. The first named town is 65 miles east of Casas Grandes, and the other 50 miles south. Reinforcements were sent to General Funston for protecting the line of communication which extended a hundred miles from the border. On March 26th, the American troops had reached a point 200 miles beyond the border, and within the neighborhood of Chihuahua city. In this territory Villa was active. He made attacks on Mexican garrisons at various points, including the town of Guerrero, where he put to death over 170 prisoners whom he had captured. Villa was said to be seriously wounded in this attack. Two days following, on March 29th, his command was surprised by a column of American troopers, including the 7th and 10th cavalry, under Colonel Dodd. The American forces numbered about 400, and the Villistas about 500. The latter fled after a brief resistance and many of them were killed. The American loss was one killed and four wounded.

Villa escaped in a carriage. His band fled in the direction of Parral to the southeast, scattering into small parties. There were other smaller encounters between these bands and the American and Mexican troops.

The American line of communication was now 300 miles long, and great difficulty was experienced in providing food, ammunition, and other supplies. Carranza for a time refused to permit the use of the railroads for this purpose, and it was necessary to use motor trucks. In time he consented to a conditional use of the railroads, specifying that all goods must be shipped from one American to another neither of whom was to be directly connected with the army. He further stipulated that the trains must have no guards. For the first two weeks in April the pursuit continued with little result, except the dispersal of the bandit forces. But while there was no direct conflict between the Americans and the bandits under Villa there was on April 12th a serious clash between American troops and those of Carranza. This took place at the city of Parral, which was reached on April 12th by two detachments of the 13th cavalry commanded by Maj. Frank Tompkins. The force numbered only about 150 men, and approached the city for the purpose of purchasing supplies and consulting with the officers in regard to a site for making an encampment outside the city. Having previously sent a messenger to the mayor of the city, Colonel Tompkins, accompanied by a guard, visited the town. He was cordially received by the commander of the garrison, General Lozano, and arrangements were made for the purchase of food and for a camp site. Major Tompkins, accompanied by General Lozano and another Mexican officer, left the town for the purpose of examining a place for the proposed encampment. Shots were suddenly fired in that direction from the town, and shouts for Villa and against Americans were heard. General Lozano and the other Mexican officer at once rode toward the town as though to stop the firing, but this continued and was directed toward the American pack train and troops. Major Tompkins succeeded in rejoining the troops and took up a position with his troops north of the railroad. He observed that the Mexicans were making a flank movement with the intention of cutting off his troops from the road to the east and north. He called upon them to retire, but they ignored his request, and he ordered his troops to fire. A fight followed, during which the Americans slowly withdrew, pursued by about 300 Mexicans. Hostilities continued from 1 o'clock in the afternoon until 8 in the evening. The Americans had been attacked in the rear and on both flanks. They had finally established themselves in a village where they were able to find shelter behind buildings. The Mexicans approached and received a volley which killed about 40 men. Firing ceased at dark. Soon a messenger from General Lozano appeared, bearing a flag of truce, and a note saying that he had been unable to control his forces. A second message demanded that the Americans immediately withdraw, otherwise the attack would be renewed. At this time a squadron of the 10th cavalry with four machine guns, led by Col. W. C. Brown, appeared. Colonel Brown at once took command and replied to Lozano's message that he would not retreat unless ordered to do so by his commanding officer. Other Amer-

ican reinforcements soon appeared, including the detachment of the 11th cavalry commanded by Col. H. T. Allen. Hostilities were not resumed. The Americans lost during the affray two killed, six wounded, and one missing.

This incident aroused the American government to the fact that opposition to the punitive expedition was so strongly felt among the Mexicans as to bring about a very dangerous situation. This conviction was strengthened by a note from Carranza, written on April 12th, the day of the Parral incident, protesting against the further presence of American troops in Mexico, and demanded their immediate withdrawal. Carranza declared that the expedition had been undertaken through a misunderstanding on the part of the American government. While admitting that its purpose had been pursued in good faith he declared that he had no intention of agreeing to extending the time of the expedition to the length it had already gone. He particularly objected to the absence of any agreement permitting the reciprocal passage of the troops of both nations across the border, and on account of the failure of any written agreements he denounced the expedition as without warrant. In spite of this protest the American troops continued to remain in the positions in which they had been after the clash of Parral. Active operations, however, came to a standstill. Nothing further was heard of Villa.

THE EL PASO CONFERENCE AND THE GLENN SPRINGS RAID. An attempt to break the deadlock resulted in a conference at the beginning of May between Generals Scott and Funston, representing the United States, and Generals Obregon and Trevino, representing Mexico. The Mexican representatives insisted upon the immediate withdrawal of the American troops or that a date be set for such withdrawal. As the American representatives refused to accede to this there was for a time a deadlock. After further discussion a tentative agreement was reached on the basis of policing by the Americans of the "northern zone" of territory north of the international boundary, and of the "southern zone" by the Mexican troops. It was also decided to limit the American advance, and to withdraw the troops as soon as it appeared that the Villistas had been wholly eliminated.

In the midst of the conference in which an agreement was about to be reached along these lines, there was suddenly another raid by Villistas who, on May 5th, attacked the village of Glenn Springs, in Texas, 15 miles north of the border. There was a garrison of nine troopers of the 15th cavalry at this place. These men took refuge in an adobe hut where they were besieged by the invaders for three hours. Three of the troopers were killed and two wounded. The sergeant in command and three other survivors succeeded in carrying away the wounded, and the bodies of those that had been killed. A number of American ranchmen in the vicinity, attracted by the firing, came to the rescue, and by four o'clock in the morning the raiders withdrew, after looting the town. Before raiding Glenn Springs they had attacked the village of Boquillas, killed a boy, and taken two American prisoners. One of these was the proprietor of the only store in the place. An expedition under Maj. George Langhorne at once started in pursuit, and within two hours they had returned with 14 prisoners. The second rescue party was

led by Major Langhorne again pursuing the Villistas, and after a march of two days and a half rescued the two Americans who had been captured. Proceeding further the expedition met and engaged a group of bandits, killing five and capturing two. Before it returned it had penetrated 168 miles of Mexican territory.

Following these raids the conference at El Paso abruptly adjourned, without having reached any agreement.

**CARRANZA'S PROTEST.** On May 22nd Carranza addressed a long note to the State Department, again demanding the immediate withdrawal of the American troops. He questioned the sincerity of the United States government in sending out expeditions and demanded a definite statement of its purpose and aims in order to end "an unsupportable situation." The note further said, "The explanation given by the American government, in regard to the crossing of troops at Columbus, has never been satisfactory to the Mexican government; but the new invasion of their territory is no longer an isolated fact, and tends to confirm the Mexican government that something more than a mere error is involved." This later act of the American forces, he said, caused new complications for the Mexican government, increasing the difficulty of finding a satisfactory solution to the tenaciousness of the international situation. The Mexican government could not consider this last incident except as an invasion of its territory, and it was its duty to request the American government to order the immediate withdrawal of these new forces, and to abstain from sending any other expeditions of a similar nature. The reference to further expeditions was to the pursuit of Villistas by the forces under Major Langhorne. Included in this note was a threat that the Mexican government would defend itself against any group of American troops fighting within its territory. The American government did not regard this note as an ultimatum, but there was no disregard of the seriousness of the situation. Reinforcements were hurried to the border, including all the troops of the regular army available and the militia of Texas, Arizona, and New Mexico. All along the border at this time there were about 50,000 men. In Mexico there were many evidences of hostile feeling against Americans following the movement of Carranza. In Chihuahua the American consulate was attacked, and the building of the American consulate was burned in Durango.

**THE CALLING OUT OF THE NATIONAL GUARD; THE AMERICAN REPLY.** In the light of the possible developments President Wilson considered it wise to call out the entire national guard of the country, and preparations in all the States were at once begun to answer such a call. The forces on the border soon reached 100,000 men. While matters were at this crisis there were further raids on the border between Laredo and Brownsville, and a third and fourth American expedition were dispatched in pursuit of the marauders, in spite of Carranza's protest. On June 15th, over 100 Mexicans attacked the 14th infantry camp at Laredo and killed three troopers. On the following day a detachment of the 26th infantry was fired upon at West Brownsville. The troops of Carranza under Maj. Alonzo Gray were sent in pursuit and had an encounter with the bandits. General Ricaut, commanding the local Carranza forces, sent an ultimatum

threatening to attack the American troops if they did not immediately withdraw. This was disregarded and the American forces advanced two miles further, made an encampment, and sent out scouting parties. They did not, however, find the bandits, and soon returned. This incident added fuel to the anti-American feeling in North Mexico, which developed to a high tension. American consuls in several border cities left their posts and returned to the United States. At this time also came a threat to General Pershing from General Trevino, commanding Carranza's army of the north, notifying the former that any movement of the American troops from their present line to the south, west, or east, would be considered a hostile act and a signal to commence actual warfare, and that if additional troops crossed the border they would be attacked. General Pershing replied that he could not recognize General Trevino's authority to question the movement of the American expedition. The situation thus produced was of the very gravest nature for the American troops already in Mexico. This was increased by a distribution of Mexican troops in a loop around General Pershing's forces, which confirmed the suspicion that Carranza was no longer concerned about cooperating with the United States to clear his own country of the bandits, but was virtually in league with impeding the American pursuit. For a time war hung in the balance. General Pershing notified the Carranza commanders that any movement threatening his forces would be on their own responsibility.

The situation was relieved on June 20th, by Carranza's receipt of the American answer to his demands made on May 22nd. In this reply Secretary Lansing bluntly refused Carranza's request for the withdrawal of American troops from Mexican soil. He intimated, moreover, that the numbers might be reinforced, and that the American forces would remain on the border until the establishment of order, since Carranza had shown that he himself was not able to bring this about. Secretary Lansing denied most emphatically any intention of the United States to establish themselves over Mexican territory, and insisted that the expeditions hitherto made were simply for the purpose of pursuing bandits and preventing further raids across the border. He said: "The Government of the United States, if it had had designs upon the territory of Mexico, would have had no difficulty in finding, during this period of revolution and disorders, many plausible arguments for intervention in Mexican affairs. Hoping, however, that the people of Mexico would, through their own efforts, restore peace and establish an orderly government, the United States has with patience waited the consummation of the revolution." Mr. Lansing further declared that the American government had concluded that "in spite of the crimes committed and the sinister design of Villa and his forces, the Mexican government does not or did not intend or desire that these outlaws should be captured or destroyed, or dispersed by the American troops, or at the request of this government by the Mexican troops." For this reason he declared that the demand that the troops should be immediately withdrawn should not be entertained. Mr. Lansing placed any responsibility for hostility between the two nations upon the shoulders of the Mexican government.

**THE CARRIZAL AFFAIR.** While this note had been dispatched but had not been received by Carranza, there was an encounter between American and Mexican troops which was the most serious which had hitherto occurred. On June 20th two troops of the 10th cavalry under Caps. Charles D. Boyd and Lewis S. Morey made a junction at Lake Santa Domingo following a scouting expedition after Villistas. On the following morning they resumed their movements through a canyon in the direction of Carrizal, southeast of Villa Ahumada, which was the field base of the Mexican forces. Their purpose was to investigate reports that Mexicans were massing near Carrizal for the purpose of threatening American columns. Having arrived within two miles of Carrizal, the troops halted, and Captain Boyd sent his Mexican guide into the Mexican town with a request to the commander to allow the passage of his troops through the streets. The commander refused this permission, but sent another messenger saying that the troops might pass through if Captain Boyd would enter the town for a parley. The latter, however, feared an ambush. While this was being considered General Gomez, accompanied by other officers, appeared, and explained that he wished a conference with the American officers outside the town. During this conference there were suspicious movements of the Mexican troops in the town. The American soldiers observed Mexicans in considerable numbers circling around the flanks of the American troops. They noted also that machine guns were being placed in position, and trained upon them. General Gomez and the other officers suddenly withdrew from the conference, and as soon as they were out of range fire was opened from the Mexican side without any notice. The Americans numbered only 84, while the Mexicans were several hundred strong. The American troops quickly formed for an attack, and charged. At a distance of 300 yards the Mexicans opened a heavy fire, and the fight began, the Americans having the disadvantage. Firing proceeded for two hours when the Americans troopers were unable to hold longer and fell back to the west and scattered. A group of Mexicans had, in the meantime, ridden in their rear and stampeded their horses. Twenty-four Americans were captured, Captain Boyd and Lieutenant Adair were killed, and 14 troopers killed or wounded, making an American loss of 40. The survivors finally found their way back to the American field headquarters. The Mexicans lost about 40 killed and 39 wounded. Among the killed was General Gomez.

**THE AMERICAN DEMANDS.** Following this affair war seemed inevitable, and the situation was made worse by the attitude of General Carranza who sent a note to the State Department on June 24th with a confirmation of the order given to General Trevino not to permit American forces to advance further southeast or west, and to oppose new incursions of American forces into Mexican territory. In spite of this warning Carranza declared that American forces had marched eastward quite far from their base and engaged Mexican troops. Secretary Lansing at once replied to this note in a message sent through the American representative in Mexico City. He stated that the United States government could put no other construction on the note than that "It is a formal avowal

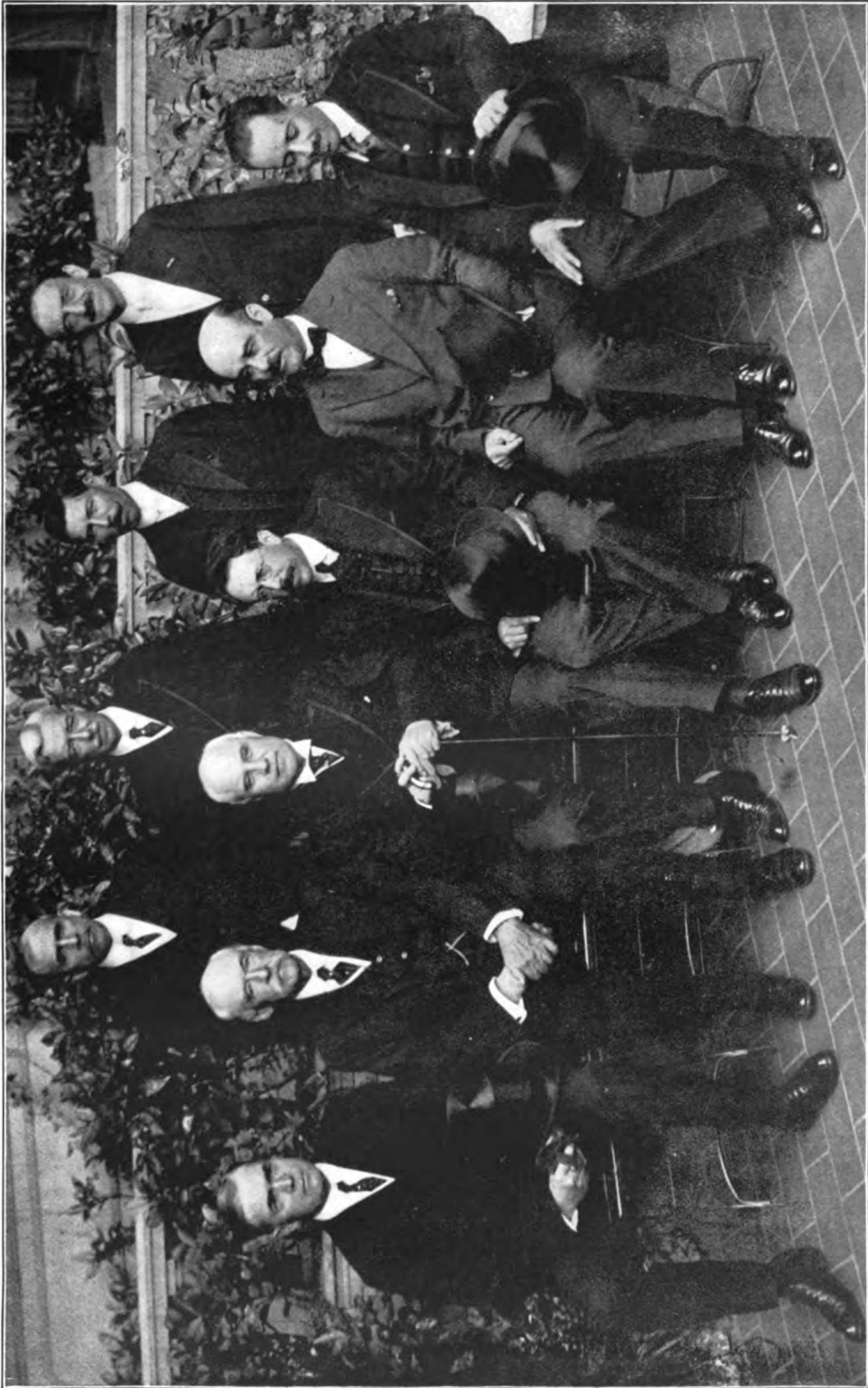
of deliberately hostile action against the forces of the United States now in Mexico, and of purpose to attack them without provocation whenever they move from their present position in pursuance of the objects for which they were sent there, notwithstanding the fact that these objects involve no unfriendly intention toward the government or people of Mexico, but are, on the contrary, intended only to assist that government in protecting itself and the territory and people of the United States against irresponsible and insurgent bands of rebel marauders."

Secretary Lansing demanded the immediate release of the prisoners taken in the encounter at Parral, together with any property of the United States taken with them. He also asked an immediate statement from the Mexican government as to the course it wished the United States to understand it had determined upon, and that this statement was to be made through the usual diplomatic channels, and not through subordinate military commanders. Following this there were some efforts of mediation on the part of Argentina, Brazil, and Chile, but to these the United States refused to listen, so long as its soldiers were imprisoned on Mexican soil. Carranza was, for a few days, defiant, but the prospect of an imminent attack by the American forces, and the constant increase of these forces along the border finally induced him reluctantly to release the prisoners, and on June 29th, having been deprived of nearly all their clothing, they passed out of the jail in Chihuahua on their way toward the border. Their passage was marked by jeers of triumph on the part of Mexicans along the way.

Carranza had, in the meantime, suppressed the publication of the American note of June 20th, until June 30th, when it appeared in the press in conjunction with a statement of his own, intended to offset the effect. Some improvement in the conditions resulted from the readjustment of the American forces in Mexico, which began immediately after the clash at Carrizal. Certain camps were evacuated, and the line was shortened. The evacuated points were promptly occupied by Mexican troops and General Trevino gave it out that the movement was a retirement northward. The new base for the American forces was 150 miles nearer the border than it had hitherto been. Carranza, in an interview given at this time, declared that he did not wish war with the United States, but rather to preserve "by all honorable means" peace with that country. He insisted that the American people did not or could not understand the Mexican point of view. This statement was an indication that he had determined upon a back-down from the warlike attitude which, up to this time, he had sustained, and this was confirmed by a note received on July 4th, which was somewhat conciliatory in its tone, and suggested mediation on the part of certain Latin-American countries to bring about a solution of the entire question. There was no further request for the withdrawal of American troops.

**THE JOINT COMMISSION.** President Wilson declined the suggestion of mediation by Latin-American republics, and in place of this brought about a conference between delegates of the Mexican and American governments. After considerable wrangling as to the scope of the deliberation of such a commission, arrangements





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Left to right, standing: Stephen Boneal, Secretary of State Lansing, Eliseo Arredondo, Dr. L. S. Rowe. Seated: J. R. Mott, Judge George Gray, Secretary of Interior F. K. Lane, Luis Cabrera, Ignacio Bonillas and Alberto J. Pani

AMERICAN-MEXICAN JOINT COMMISSION

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for its meeting were finally made. The American commissioners included Franklin K. Lane, Secretary of the Interior; Judge Gray, of the United States Circuit Court; and John R. Mott, International Secretary of the Young Men's Christian Association. The Mexican delegates were Luis Cabrera, Mexican Minister of Finance; Alberto Pani, President of the Mexican International Railways; and Ignacio Bonillas, of the Mexican Department of Communication. New London, Conn., was selected as the first meeting place, and sessions were begun in September, 1916.

The first formal session of the conference convened on September 6th. The Mexican delegates were welcomed by Secretary Lansing in an address in which he emphasized the duty of the conference to find a permanent solution of the internal difficulties of Mexico, as well as of the points in conflict between Mexico and the United States. Considerable progress was made during the first two weeks in laying a foundation for negotiations. The Mexican delegates showed unmistakably that their chief endeavor was to bring about the removal of the United States forces from Mexico. Señor Cabrera made to the delegates a comprehensive statement on the present situation in Mexico with the intention of proving that the *de facto* rule of Carranza was able to bring about stable conditions if he were given a free hand. President Wilson received the Mexican commissioners on board the *Mayflower*, and returned with them to their hotel, giving them assurances of his sympathy with the aims of the revolutionists in Mexico. He declared that the regeneration of that country must come from within, and impressed upon the delegates the necessity for the protection of life and property.

During the first weeks of the session of the conference there were indications in Mexico that Villa had again become active. Reports received from General Bell, commanding the American troops near Chihuahua, showed that Villa with a force numbering over 5000 men had captured a portion of the city of Chihuahua in spite of a large Carranza garrison at that place.

In the first week of October the joint conference renewed its deliberations in Atlantic City. Little progress was made toward a definite settlement up to this time. The Mexican delegates were reluctant to discuss any question but the withdrawal of the American troops, and the American conferees preferred to discuss other questions. It was announced at this time that 10,000 of the militia forces on the border would be sent home and relieved by troops from other States. Units from Maine, New York, Massachusetts, Rhode Island, Wisconsin, Connecticut, Montana, New Jersey, Utah, and the District of Columbia were notified that they would shortly return. The conference had, by this time, resolved itself into a general discussion of the entire question of the political, financial, and industrial stability of the present government in Mexico. On October 4th, the commission issued a statement as follows: "The morning session of the American and Mexican Joint Commission was devoted to the presentation to the Mexican commissioners by their American colleagues of the importance of giving consideration to certain questions which have a distinct international bearing, because of their effect on the status of the rights of foreigners

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resident in Mexico, and of foreigners who have invested their capital in Mexican enterprises. The position taken by the American commission is that the satisfactory solution of these questions is integral and a necessary part of a general programme, the purpose of which is to assure to Mexico the resumption of her normal position among the nations of the earth."

**RENEWED ACTIVITY OF VILLA.** Reports were received that Villa was concentrating his forces in the state of Chihuahua for an advance northward. The Mexican government made a request for financial assistance from the United States to help support the cost of the frontier patrol. Villa continued, through the latter part of October, to defeat the Carranza forces, and at Santa Ysabel, on October 20th, won a victory over them which gave him practical control of the country south and west of Chihuahua city.

**ELECTION IN MEXICO.** On October 22nd a general election took place for a new constitutional assembly to revise the organic law of the republic. Each state chose one delegate and one alternate from every 70,000 population, or each fraction of that number in excess of 20,000. Opponents of the *de facto* government were not allowed to take part in the election or become candidates. The assembly convened on the 1st of December, at Queretaro. The proposals outlined by General Carranza were reported in the American press as follows: Punishment of wrongdoings on the part of governors and other public officers; various reforms of the judiciary, including its absolute independence of the other departments of the government, and more equitable provisions for the treatment of the accused; the establishment of a minimum wage and a maximum working day; the reform of the divorce laws; the abolition of the vice-presidency; the consideration of the question whether the franchise should be universal or qualified; and the strengthening of the presidency and the central government, which was to be established by direct election. In the course of the discussion it appeared that a number of articles would be introduced on the principle of keeping Mexico for the Mexicans.

During November civil war continued to rage throughout Chihuahua. Authoritative reports from Mexico indicated that Carranza had about 175,000 men under arms, and that Villa had less than one-tenth of this number. In spite of this the latter continued to take the offensive, and he was reported to have captured the towns of Santa Rosalia and Parral, which had been abandoned by Carranza forces. Railroads in Chihuahua and other states were cut by detachments of the insurgent army, and trains from Juarez were intercepted, the passengers robbed, and soldiers who were on board the train shot. In spite of the extension of Villa's range of operation the *de facto* government showed no indication of welcoming the cooperation of the American forces. The sessions of the American-Mexican joint commission were suspended by mutual consent until after the elections of November 7th. On the eve of that election General Obregon, General Carranza, and other Mexican leaders issued interviews or statements accusing President Wilson of a lack of sincerity in pretending friendship to Mexico while permitting aid to cross the border to the insurgents and keeping an army of invasion on Mexican soil.

**THE PROTOCOL.** The joint commission met again on November 10th. After several days' deliberation the commission took a recess after reaching a tentative agreement, which was to be submitted to Carranza for his approval. The Mexican delegates obstructed the attempt of the American delegates to arrive at an agreement which would permit the sending of punitive expeditions into Mexico in case of renewed border raids. The Government of the United States insisted upon such a provision, believing that if the present army of occupation should be withdrawn and the safety of the border entrusted to garrisons of the two nations each guarding its own side of the frontier, as the Mexican delegates proposed, the Carranza forces might prove too weak to prevent attacks across the American border. The deadlock between the delegates was broken on November 24th. The protocol for agreement signed by the delegates formulated a compromise. It provided for the withdrawal of General Pershing's army from Mexican soil within 40 days after the agreement had been ratified. If new raids should occur in the meantime the operation of this provision would be suspended. Each army would patrol its own side of the border, but no special arrangement was made for establishing a neutral border zone which the armies of the other nation might use for police purposes. The United States reserved the right to send an army into Mexico to capture bandits who had invaded American territory. Further questions of claim for damages on the part of either government and plans for the sanitary and economic development of Mexico were left to future diplomatic action. After signing the agreement Secretary Lane, chief of the American members of the commission, issued a public statement in which he expressed the wish that the United States could help Mexico to become a free and prosperous nation.

**THE SITUATION AT THE CLOSE OF THE YEAR.** While the final agreement was being entered into by the members of the commission Villa was attacking the city of Chihuahua. An attack made by him on November 23rd seemed to have been repulsed with considerable loss by General Trevino. He again attacked on November 25th, and a detachment of his forces entered the city. His main force, however, remained outside and exposed to the fire of machine guns from the defenders. General Trevino, however, was unable to hold out and on November 27th began an evacuation of the city. The Federal forces made a new base for operations at Juarez.

The constitutional convention assembled in the city of Mexico on December 1st. General Carranza laid before the delegates the programme of projected reforms, including legislation for reforming the judiciary and measures on behalf of labor. The new constitution was to follow in general the outlines of the existing constitution established in 1857 by Juarez, the leader of American liberalism in the nineteenth century.

On December 3rd, the Carranza forces under Generals Ozuna and Murguia reentered Chihuahua city which Villa had previously evacuated. Before leaving the city his army burned and plundered shops and massacred many of the foreign residents, especially the Chinese. The report that several Americans were killed was denied. By the capture and temporary holding of the city Villa was able to acquire large amounts of ammunition and supplies. He was

said at this time to have commanded a force of about 10,000 men, and he was abundantly supplied with machine guns and small cannon, which he had taken from the Carranza forces. Villa next attacked the city of Torreon, and captured it on December 22nd. Two days later, San Luis Potosi, east of Torreon, fell into his hands. Villa's objective was believed to be Tampico, to the east of San Luis Potosi, on the line of the National Railroad, with the object of obtaining a port through which he might receive supplies.

The protocol signed by the American and Mexican commissioners was presented to General Carranza by Alberto Pani, one of the Mexican representatives. While he is said to have approved of it in principle he refused to sign it until the modification of some of its terms had been made. The American members of the commission informed the Mexican delegates on December 19th that they would insist on the protocol as signed three weeks previously and that no modification would be made. They refused to enter into any discussion of the matters relating to the proposed agreement until General Carranza stated definitely whether he would endorse the action which had been taken by his representatives. The commission then adjourned, awaiting a reply from Carranza. On December 28th, a message from Carranza was delivered to Secretary Lane. This was in reply to the American demand that the protocol be ratified. The message was an 800 word document, in which Carranza failed to consent to the American demands, but refrained from including anything that could be construed as a refusal. No action had been taken by the commission on this document at the close of the year.

In the operations against Villa, the American expedition to Mexico took no active part, and indications at the end of the year were, that it would shortly be withdrawn from Mexican territory.

**MEYNELL, VIOLA.** See LITERATURE, ENGLISH AND AMERICAN.

**MIAMI FLOOD PREVENTION.** See FLOODS.

**MIAMI UNIVERSITY.** A co-educational State institution founded at Oxford, Ohio, in 1809. In the autumn of 1916 the students numbered 873 and the faculty 58. The productive funds of the university amounted to \$360,006 and the total income for 1916 was \$360,006. The library contains 46,808 volumes. President, Raymond Mollyneux Hughes.

**MICHIGAN. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 3,074,560. The population in 1910 was 2,810,173.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16, were as follows:

		Acreage	Prod. Bu.	Value
Corn	1916	1,655,000	43,375,000	\$43,108,000
	1915	1,750,000	56,000,000	38,080,000
Wheat	1916	800,000	13,800,000	22,712,000
	1915	960,000	20,448,000	20,652,000
Oats	1916	1,423,000	42,690,000	22,626,000
	1915	1,530,000	64,260,000	22,491,000
Potatoes	1916	320,000	15,360,000	24,576,000
	1915	355,000	20,945,000	11,729,000
Hay	1916	2,750,000	a 4,372,000	43,720,000
	1915	2,470,000	3,458,000	42,188,000

a Tons.

	Acres	Prod. Bu.	Value
Rye ..... 1916	325,000	4,648,000	6,042,000
..... 1915	350,000	5,425,000	4,611,000
Barley ... 1916	100,000	2,450,000	2,280,000
..... 1915	85,000	2,508,000	1,555,000

**MINERAL PRODUCTION.** The mines of the State produced in 1915 265,253,370 pounds of copper, valued at \$46,424,591. In connection with this there were produced 585,933 fine ounces of silver, valued at \$297,068. The total value in copper and silver was \$46,721,659. This was an increase of \$24,635,235, or about 112 per cent in value over the production, in 1914. At the beginning of the year the production of copper was somewhat below the normal, but soon increased demand and improved prices caused an increase in production and from that time or until the end of the year mines and reduction

taken in 1914 showed a consistent increase as compared with that in 1909, with the exception of a slight decrease in the number of establishments and proprietors. The capital invested in industries in the State in 1914 amounted to \$869,043,000, or an increase of 48.8 per cent over the capital invested in 1909. The value of the production was \$1,086,162,000 in 1914, compared with \$685,109,000 in 1909, or an increase of 58.5 per cent. Salaries and wages paid out during 1914 amounted to \$250,525,000, compared with \$153,838,000 in 1909, or an increase of 62.8 per cent. The average number of wage earners in 1914 was 271,090, compared with 231,499 in 1909, or an increase of 17.1 per cent. The most important facts in relation to this census for 1914 compared with 1909 are shown in the following table:

	1914	1909	Per cent. of increase, 1909-1914 *
Number of establishments .....	8,724	9,159	-4.7
Persons engaged in manufactures .....	320,811	271,071	18.3
Proprietors and firm members .....	7,725	8,965	-13.8
Salaried employes .....	41,796	80,607	86.6
Wage earners (average number employed during the year) .....	271,090	231,499	17.1
Wage earners, by months:			
January .....	278,087	211,679	....
February .....	277,824	218,230	....
March .....	282,176	228,087	....
April .....	281,040	222,273	....
May .....	278,103	226,811	....
June .....	269,532	229,058	....
July .....	268,399	282,023	....
August .....	274,164	285,804	....
September .....	273,866	240,810	....
October .....	270,454	241,912	....
November .....	254,678	246,729	....
December .....	249,777	250,078	....
Primary horse power .....	764,183	598,288	27.7
Capital .....	\$869,048,000	\$583,947,000	48.8
Services .....	250,525,000	153,838,000	62.8
Salaries .....	68,273,000	34,870,000	95.8
Wages .....	182,252,000	118,968,000	53.2
Materials .....	592,801,000	368,612,000	60.8
Value of products .....	1,086,162,000	685,109,000	58.5
Value added by manufacture (value of products less cost of materials) .....	493,361,000	316,497,000	55.9

\* A minus sign (--) denotes decrease.

plants turned out copper as rapidly as possible. The average price of copper per pound in 1915 was \$0.175, compared with \$0.133 in 1914. The smelter production or the output of refined copper in 1915 was 236,757,062 pounds, compared with 158,009,748 pounds in 1914. The entire output of the copper is from the Keweenaw district.

The coal production in the State in 1915 was 1,156,138 short tons, valued at \$2,372,797, compared with 1,283,030 tons, valued at \$2,559,786, in 1914. In 1916 it was estimated at 1,230,000 tons. The average price per ton in 1915 was \$2.05, six cents greater than in 1914. There were employed in the coal mines of the State during the year 2569 men.

Michigan ranks second in the production of iron ore, being surpassed only by Minnesota. The total production in 1915 was 12,544,516 gross tons compared with a production in 1914 of 10,796,200 tons. There were shipped from the mines of the State in 1915 13,664,437 tons, valued at \$28,218,627, compared with 8,533,280 tons, valued at \$18,722,358, in 1914, an increase in quantity of over 60 per cent, and of over 50 per cent in value.

**MANUFACTURERS.** The census of manufactures

**TRANSPORTATION.** The mileage of single track of railways in the State on June 30, 1914, was 8898. There has been practically no construction since that date.

**EDUCATION.** The total number of school children between the ages of 5 and 21 in the State in 1914-15 was 845,754. The enrollment was 623,087. The teachers numbered 20,161, to whom were paid a total of \$11,932,392. The average monthly salary of men teachers was \$95.27, and of women \$59.95. The total net expenditure for schools during the year was \$22,384,232.

**FINANCE.** The report of the State Treasurer for the fiscal year 1916 showed a balance on July 1, 1915, of \$5,576,074. The receipts for the year amounted to \$20,929,261, and the disbursements to \$17,927,106, leaving a balance on hand June 30, 1916, of \$12,578,230.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions of the State include the Pontiac State Hospital, Kalamazoo State Hospital, the Traverse State Hospital, the Newbury State Hospital, Ionia State Hospital, State Psychopathic Hospital, the Michigan Home and Training School, Michigan Colony Farm for Epileptics at Wahjamega, Michigan State Prison

at Jackson, State House of Correction and Branch Prison at Marquette, the Michigan Reformatory at Ionia, the Industrial School for Boys at Lansing, the State Industrial School for Girls at Adrian, the State Public School at Coldwater, Michigan School for the Blind at Lansing, the Michigan State School for the Employment of the Blind at Saginaw, Michigan School for the Deaf at Flint, Michigan Soldiers' Home at Grand Rapids, the Michigan State Sanatorium for Tuberculosis at Howell. The total number of inmates in these institutions in 1916 was 13,193.

**POLITICS AND GOVERNMENT.** The political campaign opened in the State with a presidential primary held on April 3rd. Henry Ford of Detroit, although he gave notice that he was not a candidate, received 83,057 votes for the Republican nomination to 77,822 for United States Senator William Alden Smith. The Republican delegates to the national convention voted for Mr. Ford on the first ballot in accordance with the mandate of the primary, and then swung to Mr. Hughes. The Democratic presidential primary vote was 84,972 for Wilson, with 248 scattering.

At the State primaries, which were held on August 29th, Albert E. Sleeper won the Republican nomination for Governor. Lauren D. Dickinson was renominated for Lieutenant-Governor, and Charles E. Townsend was renominated for United States Senator. The candidates nominated for Governor, Lieutenant-Governor, and United States Senator all declined to run, so that the State central committee filled the vacancy by naming E. Sweet for Governor, John Smith for Lieutenant-Governor, and Lawrence Pierce for United States Senator.

On the election of Nov. 7, 1916, Justice Charles E. Hughes carried the plurality of the State by 52,322. The highest vote of any Republican presidential elector was 339,097, while the largest polled by any Democratic elector was 286,775. Benson, the Socialist candidate, received 16,126; Hanly, Prohibitionist, 8136; and Reimer, 842. Albert E. Sleeper, Republican, was elected Governor over Edwin F. Sweet by a plurality of 99,284. Dickinson, Republican, was elected Lieutenant-Governor, and Charles E. Townsend was re-elected Senator. The rest of the Republican ticket was also elected. The Republicans carried 12 of the 13 Congressional districts, and a large majority of the Legislature.

A constitutional amendment for State-wide prohibition was introduced, and adopted by a vote of 353,378 for, to 284,754 against. The amendment becomes operative on May 1, 1918.

**STATE OFFICERS.** Governor, Albert E. Sleeper, Rep.; Lieutenant-Governor, Lauren D. Dickinson, Rep.; Secretary of State, Coleman C. Vaughan, Rep.; Treasurer, Samuel Odell, Rep.; Auditor, Oramel B. Fuller, Adjutant-General, John S. Bersey, appointed by State Military Board; Attorney-General, Alexander J. Groesbeck, Rep.; Superintendent of Education, Frederick L. Keeler, Rep.; Commissioner of Insurance, John T. Winship, Dem.

**JUDICIARY.** Supreme Court: Chief Justice, Franz C. Kuhn; Associate Justices, John W. Stone, Russell C. Ostrander, John E. Bird, Joseph B. Moore, Joseph H. Steere, Grant Fellows, Flavius L. Brooke; Clerk, Charles C. Hopkins.

STATE LEGISLATURE.

	Senate	House	Joint Ballot
Republicans .....	27	87	114
Democrats .....	5	18	18
Republican majority..	22	74	96

**MICHIGAN, UNIVERSITY OF.** A co-educational State institution founded at Ann Arbor, Mich., in 1837. On Nov. 1, 1916, there were 6276 students enrolled. Including the summer session of 1916, it was estimated that the total registration for 1916-17 would be 7521. The number of members in the faculty was 600, including staff lecturers, demonstrators, and the more important administrative officials. Dr. Mellis B. Foster succeeded Dr. Hewlett as head of the department of internal medicine in the Medical School. Dr. Marcus L. Ward became dean of the Dental College, succeeding Dr. Hoff. The dental course was lengthened to four years. During the year several loan funds and scholarships of \$10,000 or less were established. The university has in productive funds the proceeds of Federal land grant sales, amounting to \$547,306, and gifts totaling \$465,984. The library contains 368,238 volumes. President, Harry Burns Hutchins.

**MILHOLLAND, INEZ.** See BOISSEVAIN, INEZ MILHOLLAND.

**MILITARY ACADEMY, UNITED STATES.** See UNITED STATES MILITARY ACADEMY.

**MILITARY AERONAUTICS.** See AERONAUTICS; MILITARY PROGRESS; WAR OF THE NATIONS.

**MILITARY PROGRESS.** The great features of the war in Europe in 1916 were still the importance of machine guns, the indispensability of heavy artillery, and the efficacy of aviation. Of still greater importance, perhaps, as affecting the entire conduct of operations, stood out the need of mobilization of industries. The whole nation was at war, whether on the lines in actual strife, or behind them in making strife possible. Recalling the fact that warfare on the greater fronts had become a matter of siege conditions, varied, from time to time, by tremendous efforts to win a decision by breaking through, it will also be well to recollect that the ordinary names that used to have a meaning in respect to the battlefield, had ceased practically to have any meaning at all. Thus, although we still may speak of *lines*, what we really mean is an *area*; in elder days, to break through at a given point, meant, all other things equal, defeat for the broken side, but to-day "points" have ceased to exist. An enemy may still be beaten by breaking through; but the gap must be miles wide and miles deep. This state of affairs is due, as every one knows, to the grip on the ground formed by the development of trench work; so great is this development, that the original single trench, so hard to capture, for example, in the American Civil War, had given way to an elaborate network of trenches, dug down in many cases yards below the surface of the ground.

But trenches alone could not, under modern conditions, effectually keep out a determined enemy; it was the trench faced, so to say, with barbed wire that had succeeded in bringing about this result. Even so, however, a wire trench was, after all, only a passive obstacle; and since

all passive obstacles, undefended, must eventually break down under suitable attack, the trench was quickened, as it were, by the employment of machine guns in vast numbers; it was reported that for every 30 yards of front a machine gun was furnished. We must, therefore, imagine attacking infantry, for this arm was still the Queen of Battles, as affronting an area intersected by trenches laced with wire, and actively defended by machine guns suitably emplaced to sweep the zone of attack. Machine guns alone could be put out of action, wired trenches alone could be overcome, but the combination of trench and wire was of itself substantially impenetrable. Hence, to sweep over the area held by the enemy, and to advance through his "lines" to the open country beyond, trenches, entanglements, and machine guns must all first be swept out of existence. To accomplish this result, recourse must be had to artillery fire of an intensity that calls for large calibres, and for numberless projectiles filled with high explosive charges. To illustrate, it was stated that in order to "put out" a single battery, an area of 20,000 to 30,000 square meters must be covered with an expenditure of from 8000 to 10,000 shell. Again, one French battery, north of Arras, fired in 24 hours more projectiles than the entire German artillery in the war of 1870-71. Only by such fire may the trenches be leveled, the entanglements broken up, and the machine guns destroyed. Under the best conditions, however, after the most deliberate preparation followed by the most scrupulous application of the teachings of experience, the effort to break through so far had failed. Not all the wire had been broken up, a few machine guns might have escaped destruction: it followed that a portion of the attack was literally mechanically held back, or found itself exposed to machine gun fire in flank or in rear, to which no answer could be made; a few machine guns might check an entire division (20,000 men). But these checks were local: the attack, costly as it proved to be, was successful in that it carried three, four, or more "lines" of trenches. The enemy position was dented, or, as the newspapers were so fond of saying, a "salient" had been pushed forward. If the process could be indefinitely kept up, its final success could not be prevented, but as this process depended upon the artillery fire mentioned, evidently guns must be pushed up from the rear to take under fire fresh areas of the enemy position, and so prepare them for fresh assaults by infantry. But obviously time and labor were needed to advance the batteries; it was no longer a question of limbering up the small field-piece and advancing to new positions whence a shaken enemy may again be battered. The guns that told were guns of position; their transport, with that of the colossal supplies of munitions needed, called for much effort, and this even if the infantry to carry on the new assaults were at hand and ready. Costly and apparently negative though these operations had so far been, no other solution had suggested itself, and a regular procedure seemed to have established itself; artillery preparation and the attack proper, followed, if successful, by consolidation and extension of the position won.

The attacking lines were protected from counter attack by curtain fire, *tir de barrage*, or drum fire, in which the pieces assigned to this

duty, firing over and on the flanks of their own troops, surrounded them, as it were, by a ring of fire through which the enemy was unable to pass, and thus gave their own people time to assure themselves in the position captured. In this curtain fire, asphyxiating shells were used. If this position projected sufficiently into the enemy zone, a reverse enemy "salient" was necessarily formed. Attempts on the sides of this salient might drive in the enemy so far that his communications with it would be exposed. When this was the case, he must either recapture the lost ground, or abandon his salient, as occurred during the battle of the Somme. What may be called a "false front" showed its usefulness, as for example, at Verdun. This false front consists merely in a position or line far to the front, and but thinly occupied. "It enables a defender to save his men, by not having to put masses of infantry from the very beginning into the danger zone throughout the terrific bombardment of modern warfare," and exacts from the attack an expenditure of time, men, and munitions out of all proportion to the results obtained by its capture.

In the battle of the Somme, Sept. 15, 1916, the so-called "tank" made its first appearance, being used by the British in their attack. This new engine of war was an armored motor car, a caterpillar tractor, of 60-70 horse power, able to make its way across shell-craters and trenches, and over and through considerable standing obstacles, such as walls, small trees, or houses. Proof against machine gun fire and rifle fire, these tanks, carrying three machine guns in a sponson on each side, were valuable in "cleaning out" trenches not completely disposed of by the artillery preparation or the infantry advance. The British were reported as having bought 1000 of these caterpillar tractors in America from the Holt Manufacturing Company of Peoria, Ill.

The experience of the war tended to establish the belief that in future wars, armies would require, first, heavy corps artillery, firing projectiles weighing from 15 to 40 kilograms; next, heavy army artillery, firing projectiles weighing 100 kilograms; and lastly, siege artillery, 28 to 42 centimeters in calibre. It was reported that the Krupps had developed a 54-centimeter piece with a range of 38 miles.

In the domain of aeronautics, the Zeppelin on land added nothing to its reputation; it was still a disappointment to its friends. But it was reported to be of service to the Germans in the naval battle of Jutland. The airplane, however, continued to prove its worth, in all the respects touched upon in previous YEAR BOOKS. Four types may be said to have been fixed, as conditioned by the class of duties required. These were scouting, artillery observation, destruction, and combat (against other airplanes). Expeditions in numbers, exceptional at the outbreak of the war, became, under certain conditions, normal. Their special targets were railways and railway stations, bridges and even trains, at rest or in motion; more than once, the transport of troops was definitely impeded by these organized attacks upon points of strategic importance. The airplane had even attacked troops in the field. Operations of the sort indicated had passed into the commonplace. Upon the question of size, authorities differ: since the weight of the

load to be carried increases more rapidly than the supporting surface, some maintained that a limit was imposed where increase of size would cease to be useful, but this was denied by others. Only experience will tell. Anti-aircraft artillery had so increased in efficiency that airplanes sought safety at an altitude of 3500 meters (11,500 feet). The biplane was recognized as superior to the monoplane in the military service. See AERONAUTICS.

Cinematographic sections were reported as existing in some armies, principally in the German, for the purpose of obtaining a living record of operations, even of battles. See MOVING PICTURES.

#### UNITED STATES

**TROOPS.** A condition of peace and anxiety prevailed during the year. An expedition of 10,000 men under General Pershing entered Mexico in March, 1916, in pursuit of Villa, and was still in Mexico at the end of the year, without having caught Villa. (See articles MEXICO; and MILITIA.) It was found necessary to occupy the border in greater force than ever. On Aug. 31, 1916, the troops in the southern department consisted of 2160 officers and 45,873 men of the regular army, and 5446 officers and 105,080 men of the national guard, making a total of nearly 160,000. The year 1916 was marked by the awakening of the country to its defenseless condition. To some, this realization spelt militarism, with the implication that militarism in the United States would prove to be the same thing that it had shown itself to be in Germany. But as to others it was clear that German militarism was merely the means of obtaining the ends of German ambition, and was thus nothing but the outward manifestation of a disease far more deeply seated, so the American public generally refused apparently to be blinded by the misapplication of this term, and the country seemed resolved to set its house in order. The national interest in the question was manifested in the press, in the considerable increase of the number of books devoted to the matter, and finally in the calm popular acceptance of the principle of universal compulsory military training. Ten years previously the enunciation of this principle would have brought on a storm of protest.

Obviously all action in respect of preparedness was dependent on Congress. The unwillingness of that body and of others to consent to the plan recommended by Mr. Garrison, the Secretary of War, led to the resignation of that officer in February. On June 3rd was approved an act "For making further and more effectual provision for the national defense, and for other purposes," commonly known as the National Defense Act. It is impossible within the limits of this article to discuss all the features of this act; we can do no more than to touch more or less briefly on its more significant portions.

The army of the United States was defined to "consist of the regular army, the volunteer army, the officers' reserve corps, the enlisted reserve corps, the national guard while in the service of the United States, and such other land forces as are now, or may hereafter be, authorized by law."

(a) *The Regular Army.* This element of the national forces was increased, the infantry by 34½ regiments, the cavalry by 10, the field ar-

tillery by 15, the coast artillery corps by 93 companies. The engineers, for the first time in United States military history, received a proper organization within the regular army, as troops auxiliary to the other arms, consisting of 7 regiments and 2 mounted battalions. The necessary auxiliary troops in the medical department, the quartermaster corps, signal corps, etc., were provided; and in addition such increase in the number of Philippine scouts, not to exceed a maximum of 12,000, as might be determined by the President. The number of general officers was increased from 7 major- and 17 brigadier-generals to 11 major- and 36 brigadier-generals respectively. The general staff corps was increased from 38 to 57 officers. Suitable increases were made in the adjutant-general's, the inspector-general's, the judge-advocate's, the medical and the ordnance departments, in the quartermaster, engineer, and signal corps, to meet the requirements of the increased size of the regular army.

This increase of the regular army was not to take place at once, but was to be made in five annual increments, beginning July 1, 1916, and closing July 1, 1920. The President was authorized to make the increase more rapidly should emergency call for it. The result of the increase of the regular army when completed, would be to add 6420 officers at a minimum, 7000 at maximum strength, 142,000 enlisted men at minimum, and 170,000 at maximum strength. The peace strength of the regular army was fixed by the National Defense Act at approximately 11,450 officers (counting those of the Philippine scouts), and not to exceed 175,000 troops of the line (including the ordnance department). To these must be added 42,750 non-combatant troops, and 5700 Philippine scouts, making a total of about 224,000 men. At war strength, the number of officers under the act would be about 12,000, and the enlisted strength 298,000.

(b) *Officers' Reserve Corps.* No provision was enacted with respect to the volunteer army, as that element of the national defense was to be called into existence only in time of war. But when so called, its great need, and more generally yet, the great need of the country, would be for officers, in not only the volunteers but in the regular army or any other troops that might be raised. An attempt to meet this need was made by providing for an officers' reserve corps, in which civilians might be commissioned up to and including the grade of major in the various arms of the service. The commissions of all officers of the reserve corps were to be in force for a period of five years only, but officers may be recommissioned. "These men," to quote the Secretary of War, "can be selected and trained in time of peace, and the officers so obtained will be far better prepared than any volunteers that could be raised hurriedly at the outbreak of war. In order to obtain these reserve officers, a reserve officers' training corps is authorized which will consist of units at the various colleges, academies, and universities throughout the country, where military education and training will be given, which in connection with six weeks' field training each summer, will give a personnel for the officers' reserve corps that is far better equipped for the duties of an officer than any heretofore available."





WATCHING FOR AÉROPLANES



OBSERVATION STATION TO GUARD AGAINST AIRCRAFT ATTACK  
French Official photographs from Jacques Boyer, Paris  
THE ANTI-AIRCRAFT DEFENCE OF THE FRENCH LINES



(c) *Enlisted Reserve Corps.* A reserve was also created for the purpose of securing men for military service with the engineer, signal, and quartermaster corps, and the ordnance and medical departments of the army, and thus supply deficiencies in railway operatives, bridge builders, nurses, telegraphers, etc.

(d) *National Guard.* The militia was defined as consisting of the national guard, the naval militia, and the unorganized militia. Enlistment in the national guard was to be for six years, the last three in the national guard reserve, created by this act. The significant point, however, of legislation dealing with this organization, was the requirement of a Federal enlistment contract; officers and men were required to take a Federal oath. These obligations, combined with the pay provided for the national guard (under a different act of Congress from the one under discussion), constitute the so-called "federalization" of this element of the national defense. It is to be remarked that an officer or enlisted man of the national guard, in his oath, swears that he will "obey the orders of the President of the United States and of the Governor of the State of —"; upon this feature comment is unnecessary.

The experiment of using the national guard in the United States service was made, and on a large scale, during 1916. Conditions on the border were such that the President, on May 9th, issued a call, through the governors of Arizona, New Mexico, and Texas, directing the concentration of the militia of those States at points to be designated. Later in the year, on June 18th, the President called into the service of the United States a large part of the organized militia, and national guard of the States of the Union and the District of Columbia. As this second call was subsequent to the date, June 3rd, of the approval of the national defense act, it was plain that the militia units concerned were taken into the Federal service while in a state of transition to national guard as defined by the act. From the point of view of national defense, however, internal difficulties of administration, temporary and local, did not constitute the points on which the country's attention was fixed. The first of these was that this great country did not have enough regular troops to protect and police its own border against, not a powerful and well-organized enemy, but bandits and irregulars. The next point was that the duty in hand, as it was national in character, should have devolved upon national troops, or at any rate should have been equitably shared; and as the regulars—national troops—were too few, that measures should be adopted to meet not only such an emergency as was presented on the border, but more generally any other emergency. The national guard, although "federalized" by the national defense act, is made up of volunteers; i. e., there is no obligation to enlist any more than there is in the regular army. Hence, the result of the experiment on the border was apparently that important national service, forming a burden that should fall equally on all, was in reality performed by a few citizens at the sacrifice of business, professions, and family. The injustice of such methods of safeguarding the nation was self-evident. National guard officers resigned by hundreds, and discharges were sought by the men.

The effect of the experiment was to strengthen the growing conviction of the country that in universal obligatory service lies the remedy to be applied.

**MATERIAL DEVELOPMENT.** The war in Europe had opened American eyes to the fact that an army or navy unprovided with aerial equipment and personnel, was beaten in advance; that wars were fought out as much by the people behind the front as by the men on the actual firing line; in other words, that resources must be mobilized as well as men. Conscious note was also taken of the fact that the United States in 1916 had no source of nitrogen under its control, but was dependent upon the importation from abroad for this indispensable element. The Congress took preliminary steps to correct these glaring deficiencies of national economy. In respect of aeronautics, it increased the appropriation of the previous fiscal year from \$300,000 to over \$14,000,000 for the year ending June 30, 1917, and enlarged the commissioned and enlisted personnel of the aviation section. It further created the grade of aviator, in case it should prove impracticable to obtain from the army officers suitable for the aviation section, and provided that aviators should be selected from especially qualified civilians. The development of the aviation section contemplated 7 aero squadrons for the regular army, 12 for the national guard, and 5 for the defenses of both coasts. To these must be added balloon units. Further, the aeroplane industry was investigated by a technical board in order to learn the productive capacity of the manufacturers of the United States. Aeroplane equipment was developed, including bombs, bomb-dropping sights, cameras, machine-gun mounts, etc., etc. One bomb developed in the United States, the Barlow, was said to be superior to any other so far made, either in America or Europe. Its charge consisted of trinitrotoluol, and it carried, besides, an asphyxiating gas. Orders were placed or proposals invited for 419 airplanes; 5 captive balloons for field artillery were ordered. Schools were established at Mineola, Long Island, and at Chicago, Ill., in addition to that previously in existence at San Diego, Cal.

Under the law, the President in time of war was authorized to place orders for ammunition, arms, munitions generally, with any firm or corporation engaged in the manufacture of these supplies, and these orders should take precedence of all private orders. Should a firm or corporation refuse to give this precedence, or to accept these orders, the President was authorized to take immediate possession of the recalcitrant plant or plants, and to manufacture the munitions in question through the ordnance department. A failure to obey the law was constituted a felony, punishable by imprisonment for not more than three years, and by a fine not exceeding \$50,000.

The Congress further authorized the appointment of a board to investigate, and to report to Congress upon, the advisability of exclusive government manufacture of war materials. The Secretary of War was directed to make, or cause to be made, a list of all privately owned plants in the United States equipped to manufacture arms or ammunition or the component parts thereof, and the President was authorized to appoint a board on mobil-

ization of industries essential to military preparedness.

These material contributions to the development of the national defense were emphasized by the appropriation of \$20,000,000 for the establishment of a nitrate plant. A council of national defense was created, composed of the Secretaries of War, the Navy, the Interior, Agriculture, Commerce, and Labor, under whom, and by whose nomination, the President was authorized to appoint an advisory commission of seven citizens qualified by the possession of special knowledge of the resources of the country. This council was expected to coordinate the military, industrial, and commercial resources of the country, and by "rational, just, and timely provisions made in advance of trouble," to prevent "the confusion, delay, and loss due to haste in a moment of national danger."

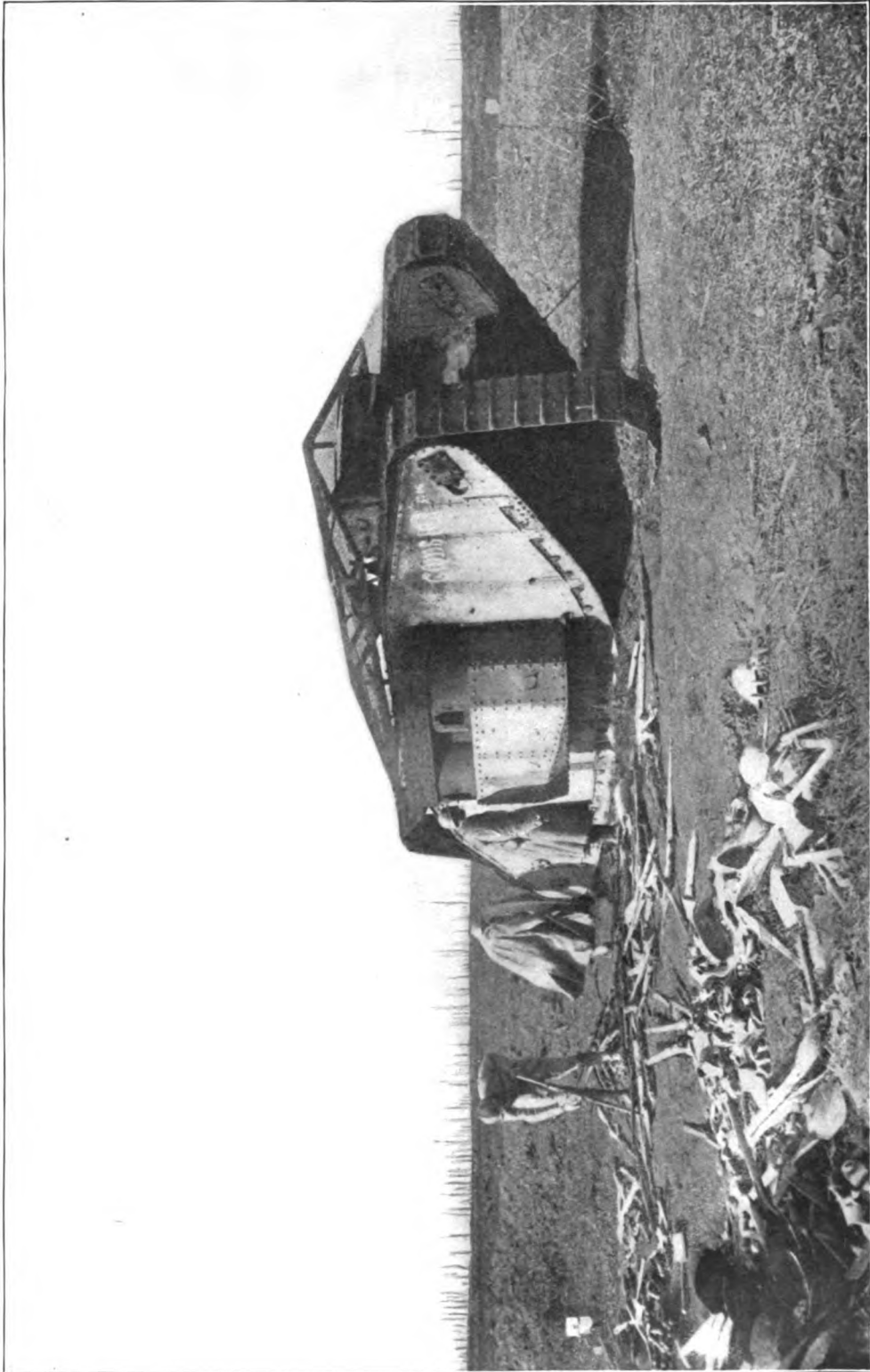
Turning now to matters of lesser range, the number of cadets at the United States Military Academy, West Point, was increased to 1332, the increase to be made in four annual increments; soldiers were given opportunities, in addition to military training, of receiving instruction along such lines as would, without diminishing their military efficiency, enable them to return to civil life better equipped for industrial, commercial, and general business occupations. This "vocational" training had already in 1915 been begun in the coast artillery corps. Examinations to determine the fitness of officers for promotion were extended to include examination for promotion to all grades below that of brigadier-general. A revision of the Articles of War was enacted into law and given to the army, and a revision and codification of all the military laws of the country ordered. The list of detached officers was increased by 822 extra officers of cavalry, field artillery, coast artillery, and infantry. Legislation affecting the general staff corps, and particularly the relations of the chief of staff to the various War Department bureaus, was interpreted by the Secretary of War as still leaving the coordination and supervision of these bureaus in the hands of the chief of staff. Fourteen training camps were held in the Eastern department, with a total attendance of 12,200 men and boys; two in the Western department, and one at San Antonio. This mode of training was recognized by Congress in the National Defense Act: "Especial attention was given during the fiscal year 1916 to the establishment of a closer cooperation between the quartermaster corps and the various transportation interests with a view to coordination in the movements and supplies for the army." The value of this cooperation was manifest in the concentration of troops on the border. The use of motor vehicles increased the efficiency of the border patrol, and made possible a regular supply service for General Pershing. The experience thus acquired was valuable in determining the type best suited to American conditions.

In recognition of the overwhelming importance of machine guns in modern warfare, the Congress appropriated \$12,000,000 for the purchase of these weapons. A board was later appointed by the War Department to investigate the machine gun question in all of its phases, and to advise the Department on the expendi-

ture of the \$12,000,000 appropriated. This board made a preliminary report, selecting the Vickers-Maxim type for heavy machine guns, and fixing a date (May, 1917) to determine by test the comparative merits of the light type. Other changes and improvements merely can be mentioned. The automatic pistol, calibre 45, was issued to all branches of the regular army, and to most of the national guard. The Ordnance Department was making experiments to determine the most suitable type of steel helmet, plastron, and shield for use in the service. An armor-piercing bullet was developed at the Frankford arsenal. Congress appropriated \$500,000 for a new army powder factory. The tests of the 3-inch gun and split-trail carriage with approximately 45 degrees traverse of the gun on the carriage, 50 degrees elevation, etc., were carried to the point where manufacture in quantity had been undertaken. A railway mount for 4.7-inch howitzer and machine guns was designed and manufactured. Projects were developed for 3.8-inch and 6-inch howitzers, more powerful than the present pieces of the same calibre. These new pieces are for field use, and will have a long range—10,000 or 11,000 yards. Similarly, 9.5-inch and 12-inch howitzers, on field carriages, were designed, intended to accompany armies in the field. A new 16-inch howitzer would fire a projectile of 1660 pounds, with a muzzle velocity of 1900 foot seconds, propelled by a charge of 240 pounds. Some of these 16-inch howitzers—or rather howitzers and mortars combined—were to be permanently mounted on railway cars and then form part of the movable sea coast defense. New designs for the 16-inch gun gave to a projectile of 2400 pounds a muzzle velocity of 2600-2700 foot seconds, with a charge of 900 pounds. The 16-inch disappearing carriage was undergoing test at Sandy Hook.

Single section, core-igniter charges were used during the year in target practice with major calibre guns, instead of multiple section charges. Marked improvement in uniformity of velocities and pressures was reported in consequence. Some experience was gained with armored motor cars, of which four were constructed; two of these each had two revolving turrets, and weighed 11,500 pounds apiece. The other two had single turrets, and weighed only 8500 pounds. A special armored car, really a sort of blockhouse on wheels, was made for and tested by the corps of engineers. Its weight was 86,000 pounds, length 47 feet, width 9 feet 1.5 inches. The armament consisted of a field piece in the centre, and machine guns. The appropriation for this class of equipment, made in the army act of Aug. 28, 1916, was \$500,000.

In the coast artillery, the effect of legislation was to give a complete manning detail for gun and mine defenses abroad, and for one-half of the gun, and all of the mine, defenses at home. The companies of the arm no longer are numbered consecutively through the arm; each defense has now its own series of numbers. The strength of the company is variable, according to the duty to be performed. A most interesting test was made in March at Fort Morgan, Ala., when the battleships *New York* and *Arkansas* fired their 12-inch and 14-inch guns at a modern emplacement to deter-



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The armored travelling battery illustrated has been disabled, but the photograph, which shows the front end, indicates the character and construction of these modern engines of war  
A BRITISH "TANK" AS USED ON THE WESTERN BATTLE FRONT



mine the effect upon the emplacement itself, upon the guns behind it, the ammunition in the magazine, the personnel manning the emplacement, and finally the accessories, e.g. telephones, sights, range-finders. The question of probability of hitting was also to be considered. Valuable information was obtained, but not published. Appropriations made (Fortification Act) at last permitted the fortifications at Cape Henry to be begun, and allotted \$6,500,000 for sea coast ammunition at home, and \$2,200,000 for the insular possessions. This act also provided for the purchase of the patent rights and the installation of a type unit of the Hammond radio-dynamic torpedo, provided that a joint board of army and navy officers reported favorably upon the device. The question of the movable artillery defenses of our sea coast, intended to protect undefended, and to prevent landing at unfortified, points, came up as involving a necessity to dwell with in the future. See UNITED STATES, *Army*.

The record of the medical corps deserves notice; there were during the year only eight cases of typhoid fever, with no deaths therefrom. The malaria and tuberculosis rates were the lowest ever known in the army.

**Bibliography.** The report of the Secretary of War for 1916, and reports generally of the Chiefs of Bureau, War Department, and the National Defense Act should be consulted for details of organization, as should the Appropriation acts. For military questions both abroad and in the United States, see the *International Military Digest*, 1916, *passim*.

**MILITARY TERRITORY OF THE NIGER.** A territory belonging to the government-general of French West Africa (q.v.). A commandant administers the government under control of the lieutenant-governor for Upper Senegal and Niger. Zinder was made the capital when the military territory was reorganized.

**MILITARY TRAINING IN SCHOOLS.** See EDUCATION IN THE UNITED STATES.

**MILITIA.** It was a notable year in the history of the militia and national guard of the United States. The act on June 3, 1916, which is commented on in greater detail in the section *Army*, article UNITED STATES, made important and far-reaching changes in the organization of the national guard. It gave the national government the requisite authority to prescribe the particular units as to plans or arm of service to be maintained in order to secure a force, which when combined, should form complete higher tactical units. Prior to June 18, 1916, the total reported strength of the militia and national guard was 8595 commissioned officers, and 123,605 enlisted men. Of this force 1451 officers and 6131 enlisted men belonged to the staff and non-combatant branches, 456 officers and 8084 enlisted men belonged to the coast artillery, and 6682 officers and 109,390 enlisted men belonged to the infantry and field artillery, cavalry, and infantry. The organizations called to the service of the United States on May 9, 1916, and June 18, 1916, include 108 regiments and 7 separate battalions of infantry; 3 regiments, 13 separate squadrons, and 22 separate troops of cavalry; 6 regiments, 12 separate battalions, and 12 separate batteries of field artillery; 3 battalions and 11 separate companies of engineers; 4 battalions, 16 separate companies of signal

corps; 1 aëro company, 23 ambulance companies, and 37 field hospitals. On July 31, 1916, there were on the border 110,957 troops, and in State mobilization camps 40,139, aggregating 151,096. The aggregate strength was short of the authorized peace strength 4083, and short of war strength 97,350. Forty-four officers of the regular army were commissioned in the national guard in the service of the United States.

Organizations of the militia and national guard of the States of Arizona, New Mexico, and Texas were called into the service of the United States on May 9, 1916. These were the first State troops employed in such service. On June 18th, the entire organized militia and national guard of all the other States were called into the service, and directed to assemble at their State mobilization camps. The removal from the rendezvous to other State camps was under the control of the State authorities, and from these camps to the stations designated on the border under the direction of the War Department. These troops began their mobilization campaign on June 27th, and on July 1st, there were on the way to the border 122 troop trains carrying over 2000 passenger and baggage cars, with a total strength of 36,042 men. Four days later 101 troop trains were on the way to the border, and up to July 31st, 112,000 militia troops were transported to the border. The task imposed on the railroads of the country involved 350 trains to carry the first 100,000 men. Over 3000 passenger cars were provided and in addition about 400 baggage cars, most of which were equipped as kitchen cars for serving hot meals, 1300 box cars, 200 stock cars, and 80 pack cars. All railroads gave preference to troops over other travelers. The distance traveled by the troops was from 600 to 3000 miles, the majority of these troops being carried over 2000 miles.

The State troops were stationed at various points along the border, the most important headquarters being McAllen, Pharr, and Laredo. Although they saw no active service, the duties performed by them were sufficiently difficult to put their physical stamina to the severest test. They were given long marches, and although in most cases the troops stood the test well, certain organizations did not show the state of preparedness which would be satisfactory under real military conditions.

The maintenance of these troops on the border was accompanied by severe criticism both as to the policy of keeping them there, and in regard to the methods of sanitation and feeding while they were in camp. In answer to a widespread demand Congress appropriated \$2,000,000 for the support of families of such of the State troops who were dependent. There were many cases of individual hardship, but in cases where sufficiently good excuses could be furnished men were discharged, and allowed to return to their homes. The mobilization of the national guard presented to the medical staff of the army a large and delicate problem. The men comprising the regiments were drawn from all parts of the country, and were transported at the height of the summer heat to the climate of southern Texas, to which few, if any, of them were in the least accustomed. All of the facilities of the health service of the army were at once devoted to sanitary meas-

ures for the safety of the men. In spite of criticism the sick rate of the combined forces on the border during the mobilization was less than 2 per cent. This is equivalent to an effective rate of 18 per thousand.

During the last two months of the year withdrawals of these troops were begun, and by the end of the year there remained on the border about 100,000 troops.

Several of the States made provision for voting for the troops at the national election. The following table gives the strength of the organized militia at the end of the fiscal year 1915:

State, Territory, or District.	1916	
	Officers	Enlisted men
Alabama	166	2,391
Arizona	54	866
Arkansas	81	834
California	245	3,218
Colorado	58	770
Connecticut	227	3,476
Delaware	35	426
District of Columbia	94	1,741
Florida	85	1,181
Georgia	225	2,859
Hawaii	98	2,548
Idaho	63	901
Illinois	500	6,099
Indiana	150	2,411
Iowa	218	3,182
Kansas	127	1,925
Kentucky	170	2,252
Louisiana	63	1,119
Maine	111	1,428
Maryland	168	2,024
Massachusetts	418	6,600
Michigan	220	3,430
Minnesota	210	2,889
Mississippi	71	1,085
Missouri	207	3,746
Montana	50	734
Nebraska	110	1,507
Nevada*	..	..
New Hampshire	83	1,175
New Jersey	301	4,021
New Mexico	87	867
New York	1,014	15,309
North Carolina	208	2,846
North Dakota	55	735
Ohio	492	5,916
Oklahoma	70	966
Oregon	96	1,595
Pennsylvania	701	9,450
Rhode Island	90	1,527
South Carolina	102	1,424
South Dakota	65	857
Tennessee	113	1,634
Texas	185	2,720
Utah	32	546
Vermont	76	878
Virginia	197	2,808
Washington	90	1,358
West Virginia	106	1,505
Wisconsin	192	3,247
Wyoming	35	579
Total	8,589	123,705

\* No Organized Militia (mustered out May 20, 1906).

For additional information in regard to the work of the army and militia on the border, see sections *Army* and *Foreign Relations* in the article UNITED STATES; see also MILITARY PROGRESS.

**MILK.** Alice C. Evans, of the United States Department of Agriculture, reports in the *Journal of Infectious Diseases*, 1916, xviii, 437, the results of an experiment of 192 samples of freshly drawn milk from 161 healthy cows, the object being to discover the bacterial content of milk freshly drawn, under sanitary conditions. She found streptococci, micrococci, and bacilli. Long-chained streptococci,

which under favorable conditions may become virulent, were found in 15 per cent of the samples, in numbers ranging from a very few up to 264,000 per c.c. Pyogenic staphylococci which may cause furuncles, abscesses, suppuration, and blood poisoning, were found in 53.8 per cent of samples, in numbers as high as 80,000 per c.c. Some of these were virulent, but the majority were not. Pathogenic bacilli were found in 23.4 per cent of the specimens examined, some of which had as many as 50,000 per c.c. While in most cases the normal mucous membrane is resistant to these organisms, even when of virulent type, nevertheless epidemics of sore throat and appendicitis have been traced to milk and particular attention has been directed to the presence of streptococci in normal udders.

Ruehle and Kulp, in Bulletin 409 of the New York Agriculture Experimental Station, have ascertained that the number of bacteria found in the air of representative stables in which milking and feeding with hay, grain, and the like were going on, varied from 50 to 200 per litre of air. The highest record was 825 per litre. In their experiments sterile water was "milked" from an apparatus designed to imitate the ordinary process of milking. The water was then examined and found to possess an average germ content of 12 per c.c. with a maximum of 73. The same process under extremely dusty conditions gave a bacterial content of 30 to 100 per c.c. Under the sanitary conditions, however, found in representative stables, the number of bacteria added to milk would appear to be extremely small, but the experiments point to the necessity of eliminating dust as much as possible during the process of milking and that dust must be taken into consideration along with other sources of contamination, such as the interior of the udders, suggested above, the cow's body, the milker's hands and clothes, and the milking utensils.

Even condensed milk, commonly supposed to be free from bacteria, has been shown to contain several varieties of pathogenic organisms. The latest study of condensed and evaporated milks, by Ida A. Bengston, of the Department of Bacteriology at the University of Chicago, shows that although the bacterial content of condensed milk is as a rule low, yet in a few cases as many as one million per c.c. have been found. Other observers have isolated the streptococcus, staphylococcus, lactic acid producing bacilli, *Bacillus enteritidis sporogenes*, *B. subtilis*, *B. mesentericus*, and the colon bacillus. Moreover, Andrewes of England has proved experimentally that the *Staphylococcus aureus* can grow freely in condensed milk with or without the presence of air. Some of the bacteria in this food product survive evaporation in vacuo, because this may be carried at a temperature considerably below the boiling point of water (212 F.). Organisms may enter from the air or other sources during the process of canning. See also DAIRYING; STRIKES AND LOCKOUTS.

**MILLS, ALBERT LEOPOLD.** An American soldier, died at Washington, D. C., Sept. 18, 1916. He was born in New York City in 1854, graduated from West Point in 1879, the same year became second lieutenant of the First Cavalry, served at Fort Walla Walla, Washington Territory (1879-82), and was employed on frontier duty elsewhere. He fought against the Crow



Indians in 1887 and against the Sioux in 1890. In 1889 he was made first lieutenant. After teaching at the State Academy, Charleston, S. C., in 1886-87, and at the Infantry and Cavalry School at Fort Leavenworth, Kan., in 1894-98, he saw active service as captain and assistant adjutant-general of volunteers in the Santiago campaign in the Spanish-American War. For distinguished gallantry in action near Santiago de Cuba he was voted the Congressional Medal of Honor in 1902. Appointed superintendent of the United States Military Academy, West Point, in August, 1898, he broadened the scope and efficiency of that institution by his administration, but in 1906 he was detached from the command at West Point and was assigned to important duty in the Philippines. In 1904 he was made brigadier-general. In 1909 he returned to the United States to command the Department of the Gulf, and during part of 1912 he was president of the Army War College. After September of that year he was chief of the division of militia affairs on the general staff. In this position the work of federalizing the State troops under the reorganization law devolved largely upon him. In August, 1916, he was promoted to be major-general.

**MILLS, BENJAMIN FAY.** An American clergyman and lecturer, died at Grand Rapids, Mich., May 1, 1916. He was born at Rahway, N. J., in 1857. The year before graduating from Lake Forest University in 1879, he had been ordained to the Congregational ministry, and for a time he was minister of a church at Rutland, Vt. After 1886, for 11 years, he devoted himself to evangelistic work; it was said that during this period he made some 500,000 converts. Then, finding himself out of harmony with trinitarian views, he severed his denominational connection, for two years conducted an independent religious movement in Boston, and from 1899 to 1911 resided in California, first as minister of the First Unitarian church of Oakland, and later as founder and minister of the Los Angeles Fellowship. Mr. Mills went in 1911 to Chicago, where he founded a similar religious organization called the Chicago Fellowship. Since 1915, when he returned to his early faith, he had been holding evangelistic services in different parts of the country. Widely known as a speaker on philosophical and social, as well as religious, subjects, he published, among other books: *God's World, and Other Sermons* (1893); *Twentieth Century Religion* (1899); *The Divine Adventure* (1905).

**MILNER, ALFRED,** first VISCOUNT. A British statesman, appointed Minister without Portfolio in Lloyd George's Cabinet, formed in December, 1916; also a member of the War Council. Lord Milner was High Commissioner for South Africa from 1897 to 1905. Since the beginning of the war, he has become known as a leading advocate of conscription. He is a Unionist.

**MINE PLANTING.** See SUBMARINES.

**MINERALOGY.** New mineral species were added to the list and some important investigations appeared during the past year. Among the works of general scope may be named *The Magic of Jewels and Charms* by G. F. Kunz, a second installment by this authority on the curious beliefs and superstitions connected with precious and rare minerals. It is rich in illustrative material and shows a thorough gleaming

of literature. Comprehensive in treatment, but so far as possible free of technical phrases, O. C. Farrington's *Meteorites: Their Structure, Composition, and Terrestrial Relations* will be found a useful guide both for the scientist and the general reader. The publication of the *Third Appendix* once more brings Dana's *System of Mineralogy*, which is perhaps more widely used as a standard of reference than any other work, to the level of current progress; the new part covers the period 1909-15, wherein a total of 183 new minerals are described. The preparation of the volume has been in charge of W. E. Ford.

A recent research by Johnston, Merwin, and Williams of the Carnegie Geophysical Laboratory develops some important facts in regard to the mineral forms of calcium carbonate. It is found that this substance may occur in three different phases, of which calcite and aragonite are familiar, but the third form has not hitherto been recognized. This is owing, perhaps, to the property it has of changing rapidly to calcite under ordinary conditions of temperature and surroundings. Aragonite, likewise, alters to calcite, but at a much slower rate so that it is fairly common in nature. Of the supposed forms of calcium carbonate previously described under the names of vatervite, conchite, ktypite, and lublinitite, none seems to represent a distinct species when examined in a critical manner. The recognition and differentiation of the several forms must be based on a series of physical, chemical, and optical tests, for no single criterion can be relied upon.

The question of the chemical structure of bornite, one of the most valuable ores of copper, seems at last to have been established, as E. T. Allen has shown that the formula is to be written  $Cu_5FeS_4$  and that previous conclusions of the variability of the mineral were based on analyses of impure material as demonstrated by optical examination of the type specimens. Crystals of bornite are found to contain chalcopyrite and chalcocite, even when they appear quite pure to ordinary methods of examination.

**DIAMOND.** The much discussed problem as to the origin of the South African diamond has been under investigation by Draper and Goodchild, who, after reviewing the evidences, conclude that the diamond has crystallized in place, as a secondary mineral growth, during the period of rock consolidation. The kimberlite pipes are true volcanic vents, and the kimberlite itself is derived from eclogite which during the process of eruption underwent differentiation whereby the heavier olivine and pyroxene constituents sank, forming an ultra-basic mass in the lower regions of the vent. This mass continued molten long after the more acid upper portion was frozen, and through the action of heated vapors of water and of carbon dioxide its viscosity was so reduced as to facilitate crystallization of the diamond. The view of the essentially igneous origin of the mineral already has a preponderance of evidence in its favor, but this new investigation helps to remove some of the difficulties in the way of its general acceptance.

**RUBY.** The manufacture of gem rubies synthetically by which the chemical and physical properties of the natural stones are reproduced in great perfection has made it highly desirable to find some reliable means of distinguishing

the two. Michel gives as a criterion for the artificial stones the presence of concentric banding and lines of bubbles which are due to the method of depositing the molten aluminum oxide. The pear-shaped melt shows an optic axis diagonal to the longer diameter. The production of artificial emerald, topaz, peridote, phenacite, and diamond has not yet been accomplished in a commercial way.

**NEW MINERALS.** The list of mineral species has been increased by the following new forms: *Koehlinite* is a combination of bismuth and molybdenum oxides, and forms greenish-yellow orthorhombic crystals; it is found at Schneeberg, Saxony. *Inyoite*, from the Death Valley region of California, is a glassy, colorless, hydrated borate of calcium and has a monoclinic crystal habit. *Meyerhofferite* resembles inyoite in chemical composition but contains less water and belongs to the triclinic crystal system. It is colorless when fresh, but changes to opaque white on weathering. *Lucinite*, an aluminum phosphate of the same composition as the new gem mineral variscite, is associated with it and forms orthorhombic crystals of nearly octahedral shape. *Laoroite* is a hydrated basic phosphate of aluminum, calcium, manganese, and sodium with some fluorine; it is probably monoclinic; it occurs at Greifenstein, Saxony. *Jesekite*, from the same place, consists of aluminum, calcium, and sodium phosphate, with

microclitic crystallization. *Bazzite* contains the rare element scandium combined with silica, crystallizes in sky-blue hexagonal prisms, and comes from Baveno, Italy. *Bassetite* is a yellow micaceous mineral carrying uranium, from Redruth, Cornwall. *Margarosanite* constitutes another new species from the noted Franklin Furnace, N. J., locality; it is a silicate of lead and calcium, forming colorless plates that seem to be of triclinic habit. *Creedite*, a double salt of calcium and aluminum fluorides and calcium sulphate, occurs in colorless grains and prisms of uncertain, possibly microclitic, form. It comes from Wagon Wheel Gap, Col. *Hibbenite*, a hydrated phosphate of zinc with water of crystallization, occurs at Salmo, B. C., and is an orthorhombic mineral. *Spencerite*, from the same locality, is a similar chemical combination but with the elements in different proportions. *Leifite* is a sodium-aluminum silicate with sodium fluoride; it is found in Greenland.

**MINERAL PRODUCTION.** The production of metals and ores in 1915 was the largest in quantity and value in the record of the mining industry of the country, except that in 1913. The total value of the production of the mines was \$2,393,831,951, compared with a value in 1914 of \$2,115,200,333. The accompanying table gives the comparative production and value of the different minerals and metals for the calendar years 1914-15.

MINERAL PRODUCTS OF THE UNITED STATES  
CALENDAR YEARS 1914 AND 1915

Product	1914		1915	
	Quantity	Value	Quantity	Value
<b>METALLIC</b>				
Aluminum (consumption) . . . . .	79,129,000	\$14,522,700	99,806,000	\$17,985,500
Antimonial lead (a) . . . . . short tons (2000 pounds)	16,667	1,572,167	28,224	8,665,736
Antimony (b) . . . . . do. . . . .	2,705	666,490	5,864	2,373,780
Bauxite . . . . . long tons (2240 pounds)	219,818	1,069,194	297,041	1,514,884
Cadmium . . . . . pounds	91,409	81,205	91,415	108,443
Chromic iron ore . . . . . long tons	591	8,715	8,281	36,744
Copper, value at New York City . . . . . pounds	1,150,137,192	152,968,000	1,388,009,527	242,902,000
Ferroalloys . . . . . long tons	255,524	9,350,245	388,644	17,450,385
Gold . . . . . troy ounces	4,572,976	94,581,800	4,887,604	101,085,700
Iron. { ore (c) . . . . . long tons	39,714,280	71,905,079	55,493,100	101,288,984
{ pig . . . . . do. . . . .	22,268,268	298,777,429	30,384,486	401,409,604
Lead (refined), value at New York City . . . . . short tons	512,794	39,998,000	507,026	47,660,000
Manganese ore . . . . . long tons	2,635	27,377	9,709	113,809
Manganiferous ore . . . . . do. . . . .	98,265	218,497	185,238	266,380
Nickel, value at New York City . . . . . pounds	845,334	318,000	1,120,556	448,222
Platinum and allied metals, value at New York City . . . . . troy ounces	6,324	280,885	6,665	478,688
Quicksilver, value at San Francisco . . . . .	16,548	811,680	21,033	1,826,912
Silver . . . . . flasks (75 pounds net). . . . . troy ounces	72,455,100	40,067,700	74,961,075	37,897,300
Tin (metallic equivalent) . . . . . pounds	208,000	66,560	204,000	78,846
Titanium ore (rutile) . . . . . short tons	94	11,280	250	27,500
Tungsten ore (60 per cent concentrates) . . . . . short tons	990	435,000	2,332	4,100,000
Uranium and vanadium minerals . . . . . do. . . . .	.....	941,800	.....	693,750
Zinc. { 1914: value at St. Louis . . . . . } do. . . . .	348,418	85,029,000	458,135	113,617,000
{ 1915: sales value . . . . . } do. . . . .	.....	.....	.....	.....
Total value of metallic products . . . . .	.....	691,081,734	.....	992,816,858
<b>NONMETALLIC</b>				
Arsenious oxide . . . . . short tons	4,670	313,147	5,498	802,116
Asbestos . . . . . do. . . . .	1,247	18,965	1,781	76,952
Asphalt . . . . . do. . . . .	d 440,571	d 3,659,092	740,254	5,242,078
Barytes (crude) . . . . . do. . . . .	d 52,747	d 155,647	108,547	381,082
Borax (crude) . . . . . do. . . . .	62,400	1,464,400	67,008	1,677,099
Bromine . . . . . pounds	576,991	203,094	855,857	856,307
Calcium chloride . . . . . short tons	19,403	121,766	20,535	130,880
Cement . . . . . barrels (380 pounds net)	87,257,552	80,533,203	87,685,222	75,155,102
Clay. { products . . . . .	.....	164,986,983	.....	163,120,232
{ raw (c) . . . . . short tons	2,209,860	8,756,568	2,362,954	8,971,941
Coal. { bituminous . . . . . do. . . . .	422,703,970	493,309,244	442,624,426	502,037,688
{ Pennsylvania anthracite . . . . . long tons	81,090,681	188,181,399	79,459,376	184,653,498
Cobalt oxide . . . . . pounds	.....	.....	.....	.....
Coke (c) . . . . . short tons	34,555,914	88,334,217	41,581,150	105,508,868
Diatomaceous (infusorial) earth and tripoli . . . . . do. . . . .	.....	252,327	.....	611,021
Emery . . . . . do. . . . .	465	2,425	3,063	81,131
Feldspar . . . . . do. . . . .	135,419	629,873	113,769	629,856
Fluorspar . . . . . do. . . . .	95,116	570,041	136,941	764,475
Fuller's earth . . . . . do. . . . .	40,981	408,646	47,901	489,219

Product	1914		1915			
	Quantity	Value	Quantity	Value		
Garnet for abrasive purposes .....	do...	4,281	145,510	4,301	189,584	
Gems and precious stones .....	do...		124,651		170,431	
Graphite..	} amorphous .....	short tons.	1,725	38,750	1,181	12,858
		} crystalline .....	pounds.	5,220,589	285,368	7,074,370
Grindstone and pulpstones .....	do...		689,344		648,479	
Gypsum .....	short tons.	2,476,465	6,895,989	2,447,611	6,596,898	
Lime .....	do...	8,880,928	d 18,268,938	8,589,699	14,386,756	
Lithium minerals .....	do...	(b)	(b)	(b)	(b)	
Magnesite (crude) .....	do...	11,293	124,223	30,499	274,491	
Marls .....	do...	(b)	(b)	(b)	(b)	
Mica..	} scrap .....	do...	8,780	51,416	3,959	50,510
		} sheet .....	pounds.	556,933	278,540	553,821
Millstones .....	do...		43,316		53,480	
Mineral paints	} natural pigments .....	short tons.	66,766	d 638,390	57,442	551,598
		} zinc and lead pigments .....	do...	106,791	9,978,710	141,888
Mineral waters .....	gallons sold.	54,358,466	4,892,328	52,113,503	5,188,794	
Natural gas .....	do...		94,115,524		101,312,881	
Oilstones, etc. ....	do...		167,948		116,175	
Peat .....	do...		309,692		288,587	
Petroleum .....	barrels (42 gallons).	265,762,585	214,125,215	281,104,104	179,462,890	
Phosphate rock .....	long tons.	2,734,043	9,608,041	1,885,667	5,413,449	
Pumice .....	short tons.	27,591	59,172	27,708	63,185	
Pyrite .....	long tons.	386,662	1,288,346	394,124	1,074,823	
Salt .....	barrels (280 pounds net).	34,804,683	d 10,197,417	38,281,496	11,747,686	
Sand..	} glass .....	short tons.	1,619,649	1,563,030	1,884,044	1,606,640
		} molding, building, etc., and gravel .....	do...	77,662,086	22,278,969	74,719,259
Sand-lime brick .....	do...		1,058,512		1,185,104	
Silica (quartz) .....	short tons.	153,401	860,502	112,575	278,558	
Slate .....	do...		5,706,787		4,958,915	
Stone .....	do...		d 77,544,108		74,595,852	
Sulphur .....	long tons.	327,684	5,954,286	(b)	(b)	
Sulphuric acid (60° Baumé) from copper and zinc smelters .....	short tons.	760,838	5,190,293	904,653	7,621,241	
Talc and soapstone (exclusive of fibrous talc) .....	do...	86,221	1,043,801	98,677	1,026,739	
Talc, fibrous .....	do...	86,075	821,286	88,214	864,848	
Thorium minerals (monazite), and zircon .....	pounds.					
Total value of nonmetallic products .....			1,423,648,599		1,893,565,098	
Total value of metallic products .....			691,081,784		992,316,858	
UNSPECIFIED						
Metallic and nonmetallic (estimate) .....			470,000		7,450,000	
Grand total .....			2,115,200,383		2,893,881,951	

a From all sources. Values excluded from metallic totals as the values of the antimony contained in antimonial lead are included in the antimonial lead values, and the remainder under "Unspecified."  
 b Value included under "Unspecified."  
 c Value not included in total value.  
 d Figures for 1914 revised in 1915.

The mineral production in 1916, although exact figures were not available, at the end of the year, was undoubtedly greater than any other year since records have been kept. Never before was so large a draft upon the natural resources of the country as during the year, and never before were the metals extracted from ores of less waste or utilized to better advantage in advancing the general prosperity of the country. Copper made the most notable gain. The output of nearly 2,000,000,000 pounds was double that of 10 years previous, and its value was twice that of the copper produced in 1915. In value copper contended with iron in 1916 for first place among the metals. Together the amount of these two metals produced during the year had a value of more than \$1,000,000,000. The output of zinc from domestic ores increased in 1916 95,000 tons, which makes a new record for the metal. The total value of spelter from ore was \$150,000,000. Lead also showed a large increase. The output was valued at \$75,000,000, which is a gain of more than 50 per cent.

With the activity in metal production the coal mines were operated to meet a heavy demand. Bituminous coal output passed the half million ton mark, an increase of 12½ per cent over 1914. Coke increased 30 per cent. There was a new record also in the petroleum yield. The estimated marketed production of crude petroleum for 1916 was 292,000,000 barrels, or 11,000,000 barrels more than 1915. A mineral

production which furnishes an index for business purposes is cement. In 1916 the production is estimated at 5,000,000 barrels in excess of the output of 1914, while the shipments were even greater, and aggregated 94,600,000 barrels.

Every Western State in 1916 showed a large increase in the yield of metals. Arizona led with a gain of \$100,000,000 over 1914, while Utah and Montana together showed an increase of another \$100,000,000. Alaska had its best year in the production of metals, contributing a total of more than \$50,000,000, or over 50 per cent in excess of any previous year.

**MINIMUM WAGE.** During the last four years there has developed in the United States an extensive public opinion supporting a movement for the enactment of minimum wage laws for women. This movement has been based primarily on various investigations made by both public and private authorities showing that a large proportion of women employed in various branches of unskilled labor were receiving wages much below sums required for the maintenance of normal standards of living. The first legislation was a Massachusetts law enacted in 1912 providing for investigations. Two years later the Massachusetts law was strengthened, and since 1912 Arkansas, California, Colorado, Kansas, Minnesota, Nebraska, Oregon, Utah, Washington, and Wisconsin enacted minimum wage laws of varying scope and thoroughness. Investigating commissions have been created in

various States. In 1916 developments were limited to the further consideration of various problems connected with minimum wage legislation and rulings of previously established commissions.

**MASSACHUSETTS.** A recommendation that adult women employed in women's clothing factories in Massachusetts be paid not less than \$8.75 for a full week's work was made to the Massachusetts Minimum Wage Commission July 19th, by a wage board appointed to investigate the subject. The board further recommended that a wage of not less than \$7 a week be paid to inexperienced women, and not less than \$6 per week to girls under 18 years in the industry. The commission approved the rates provisionally and held public hearings for employers and employees in August. Thereafter the rates were decreed to go into effect Feb. 1, 1917. A report accompanying the recommendation said that after an investigation lasting eight weeks, the board had fixed upon \$8.98 as representing the necessary weekly cost of living for self-supporting women employed in skirt, cloak, suit, dress, and waist factories, this total including an item of 25 cents a week for savings. But the report further stated that, because the proposed minimum wage, \$8.98, was so far above the wages now paid in some establishments, and thus might entail hardships on both employer and employee during readjustment, the committee had reduced the amount to \$8.75.

The executive committee of the Merchants and Manufacturers of Massachusetts issued in August a pamphlet entitled *The Minimum Wage, A Failing Experiment*. This set forth briefly the history of the minimum wage movement in Australasia, England, and the United States and presented criticisms. It was objected to minimum wage laws that they attempted by class legislation aimed at employers and in favor of employees to solve the problem of normal standards of living, which is a community problem and should be met by the community. It was argued that such laws are circular in effect, since they raise the cost of living. They also produce unemployment; the evidence submitted on this point was designed to show that large numbers of girls and women were discharged after minimum wage decrees were issued; but no comparison with the general condition of industry was given. The pamphlet contended that competition between States required that, if any such laws were to be in operation, a Federal law be enacted to equalize wage conditions.

**ILLINOIS.** The O'Hara Vice Commission of the Illinois Senate reported January 19th its findings and conclusions based on an extensive investigation of conditions in Illinois, and especially in Chicago. The investigation was begun in August, 1913, and covered inquiries into conditions existing in Chicago, Springfield, Peoria, Alton, East St. Louis, and other cities of the State. The report asserted that low wages were responsible for the greater part of immorality among young girls; other causes of vice were improper working conditions, insanitary and unsegregated rest rooms for factory girls, and unlimited hours of labor. The report was compiled from the testimony of scores of working girls and their employers. The report recommended many phases of legislation, first of which was the "enactment of a minimum wage law."

**NEW YORK CITY.** The strike among workers

in New York's new subway in the spring was caused by growing dissatisfaction with conditions of work. Ten thousand excavators demanded a wage of \$2 a day, which has come to be a moderate sum even for the unskilled worker. The labor law requires that the wages of such workers be determined in accordance with the "prevailing rate" for the locality where the work is being done. Hence the subway workers believed themselves to be underpaid. The National Consumers' League filed a memorandum with the Thompson Committee, which was investigating the Public Service Commission, recommending regulation of wages and hours, with a minimum rate of pay stipulated in the public contracts. The League said: "The demand for a \$2 rate cannot be considered unreasonable in view of the results of the city's own official investigation of wages. The Municipal Bureau of Standards recently submitted to the Board of Estimates a report on the cost of living for an unskilled laborer's family in New York City. It concluded that below \$840 a year an unskilled laborer's family of five, husband, wife, and three children under 14 years, cannot maintain a standard of living consistent with American ideas." The League stressed the fact of the need of a minimum wage for the muckers as well as other employees of the Public Service Commission in New York City.

**CATHOLIC SOCIETIES.** The 15th annual convention of the Federation of Catholic Societies in New York City in August showed much enthusiasm for the minimum wage. Prof. John A. Ryan of the Catholic University of America was the chief speaker in the discussion. He asserted that the minimum wage was a question of right and wrong in which Catholics should be especially interested. He said further that since 80 per cent of the workers are unorganized, the issue could not be solved by the labor leaders, and that society must regulate industry, as it was as just to regulate wages by law as to compel safety devices or limit exorbitant rates.

Rev. Edwin V. O'Hara, chairman of the Oregon State Commission on the Minimum Wage, was another speaker. He declared that in Oregon, contrary to the fear that the general average of wages would be lowered, a higher percentage of women are now getting \$12 a week than before the passage of the law prescribing a minimum wage for women. After the law went into effect, one evil was discovered, however. It was the practice of discharging the apprentice who receives \$6 a week at the end of the first year and then hiring another apprentice to take her place. This has been remedied by the use of a sliding scale of weekly wages over monthly periods during the first year of work.

**FORD MOTOR COMPANY.** About 1500 women employees of the Ford Company, the majority of them clerks and stenographers, were affected by the ruling which went into effect October 10th, that their minimum daily wage should be \$5, the same as that established for the men in 1913. This ruling was based upon the principle of equal pay for equal work. Some of the workers, especially those in the upholstery department, gained a substantial increase, as some had been paid only \$3 a day. For apprentices under 21, the minimum remains at 26 cents an hour; for apprentices over 21, 34 cents an hour.

and for the trained worker over 21, it is raised to 62½ cents an hour.

THE NATIONAL ASSOCIATION OF MANUFACTURERS at a meeting in New York City discussed a report of its Committee on Industrial Betterment containing a survey of legislative minimum wages, history of such legislation in this country and abroad, outlines of arguments for and against the principle of the minimum wage, and findings of the committee after one year of investigation. This committee concluded: "We are of the opinion that, while certain plausible arguments are advanced in behalf of the minimum wage system, the chief of which being the general impotency of women and minors under all circumstances to safeguard their own wage conditions, we nevertheless believe that economically the weight of the argument is against the extension of the system and its incorporation into our industrial fabric."

THE MINIMUM WAGE COMMISSION of the National Civic Federation on February 20th made a report of its investigations. These covered conditions in 11 States where minimum wage laws were already in force. For a year the committee carried on the work of taking testimonies and opinions of labor leaders, statisticians, representatives of business, and others. After completing the investigation, in substance it recommended as follows: first, that a resolution be passed by Congress directing a joint investigation by the Department of Labor and the Department of Commerce, which shall be provided with enough money to make a thorough inquiry. Objections may be made by employers against further inspection of their books, it was admitted, but the commission was convinced that authoritative knowledge is necessary. Second, that before standards be set for a fair day's pay, some means be devised for determining what is a fair day's work. At present there is no way of knowing what a fair day's work is. Hence it is recommended that there be an unprejudiced and unbiased agency that will enable the employer to know what he should get for his money, and the employee what he is to give in return. A. J. Porter, president of the Shredded Wheat Company, is chairman of the commission; other members are: Percy S. Straus, Dr. Lee K. Frankel, Mrs. Lyndsay Van Rensselaer, Miss Thalia Broen, James W. Sullivan, and H. J. Conway.

AUSTRALIA. Investigations by Paul Collier of the New York State Factory Commission showed that minimum wage regulation is no longer an experiment in Australasia, but is accepted as an inevitable step in labor legislation. Mr. Collier found that the law has given an "impetus to fairer rewards for labor" and that the "weight of opinion is contrary to the supposition that the minimum wage is the maximum." He asserted that the rise of wages has kept pace with the increased cost of living; sweating has been abolished; and women have not displaced men in industry. With the first minimum wage legislation a slight curtailment in labor force followed, but normal conditions were quickly restored. Mr. Collier concluded that the creation of minimum wage boards has had a tendency to strengthen rather than to weaken the power of the trade unions, since they are influential in the nomination of board members and in the initiation of its proceedings.

MINING. See section so entitled under vari-

ous countries; also MINERALOGY; MINERAL PRODUCTION; UNITED STATES, *Bureau of Mines.*

MINNESOTA. POPULATION. The estimated population of the State on Dec. 31, 1916, was 2,296,024. The population in 1910 was 2,075,708.

AGRICULTURE. The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn .....	1916 2,520,000	84,420,000	\$67,536,000
	1915 2,800,000	64,400,000	39,928,000
Wheat .....	1916 3,715,000	27,555,000	44,639,000
	1915 4,160,000	70,870,000	63,788,000
Oats .....	1916 3,325,000	88,112,000	41,413,000
	1915 3,225,000	138,675,000	44,376,000
Potatoes ...	1916 280,000	16,800,000	21,840,000
	1915 285,000	30,210,000	11,782,000
Hay .....	1916 1,890,000	3,496,000	24,472,000
	1915 1,700,000	3,247,000	20,781,000
Rye .....	1916 335,000	5,025,000	6,382,000
	1915 350,000	6,825,000	5,528,000
Barley .....	1916 1,375,000	26,125,000	22,729,000
	1915 1,250,000	88,125,000	18,681,000

a Tons.

MANUFACTURES. The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments..	5,561	5,974
Average number of wage earners .....	84,767	92,834
Capital invested .....	\$275,416,000	\$354,434,000
Wages .....	47,471,000	58,507,000
The value of materials used	281,622,000	336,849,000
The value of products .....	409,420,000	493,354,000

MINERAL PRODUCTION. Minnesota is the first of the States in the production of iron ore. The total quantity mined in 1915 was 33,464,660 gross tons, compared with 21,946,901 gross tons in 1914. The quantity shipped from the mines of the State in 1915 was 32,545,236 tons, compared with 23,298,457 tons in 1914. The value of the ore shipped in 1915 was \$57,742,643, compared with a value in 1914 of \$40,628,771, an increase of \$9,246,889, or over 40 per cent. All the iron ore mined in the State is hematite.

TRANSPORTATION. The total mileage of railroad track in the State on June 30, 1916, was 89,906. The lines having the longest mileage are the Great Northern 2100, Minneapolis, St. Paul, and Sault Ste. Marie, 1131, Chicago, Milwaukee, and St. Paul, 1233, and the Northern Pacific, 1021.

EDUCATION. The total enrollment in the public schools of the State in 1916 was 481,583. The average daily attendance was 374,632. The teachers numbered 17,792. The average monthly salary of male and female teachers was \$62.15. The Legislature of 1915 passed a law establishing day schools for deaf, dumb, and blind subnormal children, and those of defective speech. These special schools are established in connection with public schools. The same Legislature passed a law establishing a State teachers' retirement fund. These were in operation in 1916.

FINANCE. The latest report of the State Treasurer is for the fiscal year 1916. There was

a balance on July 31, 1914, of \$3,807,000. The receipts for the year amounted to \$22,481,933, and the disbursements to \$22,957,757, leaving a balance on July 31, 1915, of \$3,332,006.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include the Anoka State Asylum, Hastings State Asylum, the Fergus Falls State Hospital, the Rochester State Hospital, St. Peter State Hospital, School for the Blind at Faribault, School for the Deaf and the School for the Feeble-Minded, both at Faribault, Owatonna State Public School, the Red Wing State Training School, the Sauk Center Home School for Girls, St. Cloud Reformatory, the Stillwater State Prison, the State Sanatorium for Consumptives, Phalen Park Hospital for Crippled Children, and the Willmar State Hospital for Inebriates. The total number of inmates in these institutions is about 10,000.

**STATE LEGISLATURE.** Legislature non-partisan.

**POLITICS AND GOVERNMENT.** The campaign in Minnesota was an aggressive one, and the results were so long in doubt, that it took over a week to determine who had received a plurality of the votes for President. (See UNITED STATES, *Presidential Campaign*.) Elections were held for Governor and United States Senator. The Republican candidate for Governor, J. A. A. Burnquist, was elected by an enormous plurality. He received 245,852 votes, compared with 93,115 for Dwyer, his Democratic opponent. For United States Senator, E. J. Kellogg, the Republican nominee, received 185,171 votes, compared with 117,543 for Lawler, his Democratic opponent. For President, Hughes received 179,553 votes, and Wilson 179,157, or a plurality of 396 votes for Mr. Hughes. The Republicans elected all their State officers, except Adjutant-General, and Commissioner of Insurance.

**STATE OFFICERS.** Governor, J. A. A. Burnquist; Lieutenant-Governor, Thomas Frankson; Secretary of State, Julius A. Schmahl; Auditor, J. A. O. Preus; Treasurer, Henry Rines; Attorney-General, L. A. Smith; Adjutant-General, Fred B. Wood; Superintendent of Education, C. G. Schultz; Commissioner of Insurance, S. D. Works—all Republicans except Wood (not stated), and Works, Democrat.

**JUDICIARY.** Supreme Court: Chief Justice, Calvin L. Brown; Associate Justices, G. L. Bunn, Oscar Hallam, Andrew Holt, James H. Quinn; Clerk, I. A. Caswell.

**MINNESOTA, UNIVERSITY OF.** A State educational institution in Minneapolis, Minn., founded in 1868. In all departments of collegiate work the total enrollment in the fall of 1916 was 5114. Including teaching fellows, the faculty numbered 812. During the year the president, George Edgar Vincent, resigned to assume the presidency of the Rockefeller Foundation. The productive funds of the university amount to \$1,647,059 and the income for 1916 was about \$61,000. The library contains 206,700 bound volumes and 52,300 unbound volumes and pamphlets.

**MISSISSIPPI. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 1,964,122. The population in 1910 was 1,797,114.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

		Acreage	Prod. Bu.	Value
Corn	.....1916	3,400,000	47,600,000	\$46,648,000
	.....1915	3,550,000	67,450,000	48,842,000
Wheat	.....1916	6,000	90,000	158,000
	.....1915	5,000	100,000	105,000
Oats	.....1916	320,000	5,760,000	4,282,000
	.....1915	300,000	6,450,000	3,870,000
Rice	.....1916	1,900	53,000	42,000
	.....1915	1,800	45,000	40,000
Potatoes	..1916	12,000	780,000	1,248,000
	.....1915	13,000	1,170,000	983,000
S. potatoes	..1916	77,000	6,314,000	4,280,000
	.....1915	75,000	8,250,000	4,538,000
Hay	.....1916	275,000	a 371,000	4,081,000
	.....1915	250,000	350,000	3,850,000
Cotton	.....1916	3,114,000	b 800,000	78,523,000
	.....1915	2,785,000	954,000	52,511,000

a Tons. b Bales.

See also AGRICULTURAL LEGISLATION.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments . . . . .	2,598	2,209
Average number of wage earners . . . . .	50,884	46,702
Capital invested . . . . .	\$72,393,000	\$81,006,000
Wages . . . . .	18,768,000	19,177,000
The value of materials used . . . . .	36,926,000	41,840,000
The value of products . . . . .	80,555,000	79,550,000

**TRANSPORTATION.** The railway mileage of the State in 1916 was 4351. There was no construction during the year.

**EDUCATION.** The number of school children in the State in 1916 was 788,927. Considerably over half the children of school age in the State are colored. In addition there are about 400 Indian children of school age. The State has no compulsory school law.

**FINANCE.** The latest statistics available for the State are for 1915. In that year the receipts amounted to \$3,873,254, and the disbursements to \$4,248,109. There was a balance at the beginning of the year of \$636,708, and at the end of \$261,362. The bonded debt of the State is \$2,500,000.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions of the State are under the control of the State board of charities and corrections. They include the State prison, Institute for the Blind, Institute for the Deaf and Dumb, and Charity Hospital, all at Jackson. There are also hospitals at Vicksburg and at Natchez.

**POLITICS AND GOVERNMENT.** There was no election for State officers in 1916. Senator Williams was reelected, practically without opposition. For President, Wilson received 80,422 votes, and Hughes 4253.

**LEGISLATION.** The Legislature met in 1916 and enacted many important measures. A record of these follows:

An amendment adopted by the people in November, 1914, increasing the number of Supreme Court judges to six, requiring them to be elected by the people, and fixing their terms at eight years was inserted in the State constitution. There was also inserted in the constitution an amendment adopted by the people in 1914 permitting the Legislature to provide that in all civil cases, circuits or chancery courts, nine or more jurors may agree on the return of verdict.

A State board of law examiners was created, and measures were passed admitting women to the practice of law. Public hangings were prohibited. Lobbying before the Legislature was regulated. Measures were passed regulating the purchase of text books, and the subjects to be taught in the public schools. It was made a misdemeanor to mutilate or otherwise misuse the United States flag. The law applies to the State and Confederate flags as well as to the United States flag. The laws relating to fire and life insurance were amended.

**STATE OFFICERS.** Governor, Theodore G. Bilbo; Lieutenant-Governor, Lee M. Russell; Secretary of State, J. W. Power; Treasurer, J. P. Taylor; Auditor, Robert E. Wilson; Adjutant-General, E. C. Scales; Superintendent of Education, W. F. Bond; Attorney-General, Ross A. Collins; Land Commissioner, M. A. Brown; Commissioner of Agriculture, P. P. Garner; Commissioner of Insurance, T. M. Henry—all Democrats.

**JUDICIARY.** Supreme Court: Chief Justice, S. Smith; Associate Justices, S. C. Cook, J. Morgan Stevens, E. O. Sykes, J. B. Holden, George H. Ethridge; Clerk, George C. Myers.

**STATE LEGISLATURE.** The State Legislature is wholly Democratic.

**MISSISSIPPI, UNIVERSITY OF.** A State educational institution at Oxford, Miss., founded in 1844. In the autumn of 1916 there were 592 students enrolled and the faculty numbered 38. The productive funds of the institution amount to \$700,000. The library contains 31,000 volumes. Chancellor, Joseph Neely Powers.

**MISSOURI. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 3,420,143. The population in 1910 was 3,203,335.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn . . . . . 1916	6,775,000	132,112,000	\$118,901,000
1915	6,500,000	191,750,000	109,298,000
Wheat . . . . . 1916	1,950,000	16,575,000	27,849,000
1915	2,778,000	84,108,000	38,426,000
Oats . . . . . 1916	1,290,000	32,250,000	17,092,000
1915	1,325,000	31,850,000	12,108,000
Rye . . . . . 1916	21,000	281,000	284,000
1915	25,000	338,000	291,000
Barley . . . . . 1916	5,000	100,000	93,000
1915	5,000	125,000	79,000
Potatoes . . . . . 1916	91,000	5,460,000	9,828,000
1915	90,000	8,820,000	5,292,000
Hay . . . . . 1916	8,850,000	a 4,355,000	40,502,000
1915	8,050,000	4,638,000	39,406,000
Tobacco . . . . . 1916	8,200,000	b 8,040,000	456,000
1915	3,500,000	3,150,000	378,000
Cotton . . . . . 1916	182,000	c 62,000	5,644,000
1915	96,000	48,000	2,527,000

a Tons. b Pounds. c Bales.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments..	8,375	8,386
Average number of wage earners . . . . .	152,993	152,182
Capital invested . . . . .	\$544,348,000	\$522,548,000
Wages . . . . .	80,848,000	89,197,000
The value of materials used.	354,411,000	388,715,000
The value of products . . . . .	574,111,000	637,952,000

**MINERAL PRODUCTION.** The production of silver, copper, lead, and zinc in the State in 1915 was valued at \$53,683,420, compared with \$25,874,864 in 1914. Lead is the most important mineral product. The value of the lead mined increased \$4,757,624 so that the largest increase in the total value was caused chiefly by the much larger output under higher prices of spelter in 1915 compared with 1914. The total production of lead was 210,440 tons, compared with 192,612 tons in 1914. In 1915 the value was \$19,781,360, compared with a value of \$15,823,736 in 1914. The zinc produced in 1915 amounted to 136,300 tons, valued at \$33,802,400, compared with 105,994 tons, valued at \$10,811,388, in 1914.

**TRANSPORTATION.** The railway mileage of the State is about 8150. The roads having the longest mileage are the St. Louis and San Francisco, 1719; Chicago, Burlington, and Quincy, 1135; Missouri and Pacific, 1013; and the Wabash Railroad, 655. These figures are for single track only.

**EDUCATION.** The latest figures available for education are for 1915. In that year the total number of students of school age was 922,731. The total enrollment was 711,355. The average daily attendance was 528,153. The total number of teachers was 19,826. The average annual salary of male teachers was \$603, and of females \$511. The total amount of payments for educational purposes during the year was \$19,700,000.

**FINANCE.** The latest report for the finances of the State is for the fiscal year 1914. The total receipts for that year amounted to \$10,538,368, and the disbursements to \$10,862,194, leaving a balance in the treasury on Jan. 1, 1915, of \$534,944.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions are under the supervision of the State Board of Charities and Corrections. They include hospitals at Fulton, St. Joseph, Nevada, and Framington, Industrial School for Boys at Boonville, Colony for Feeble-Minded and Epileptics at Marshall, Missouri School for the Deaf at Fulton, Missouri School for the Blind at St. Louis, Federal Soldiers' Home at St. James, Confederate at Higginsville, State Sanatorium at Mount Vernon, State Penitentiary at Jefferson City.

**POLITICS AND GOVERNMENT.** Early in the 1916 campaign Missouri was regarded as one of the possibly doubtful States because of local issues. Though the Democrats controlled the State offices, had 14 of the 16 Congressmen and both United States Senators, there was much criticism of the Democratic State administration's financial record. The Republicans were centering their attacks on the lack of State funds, asserting State bankruptcy because of overappropriation, that educational and eleemosynary institutions were suffering from lack of funds, and that several of these were operating on borrowed money.

Democratic campaigning opened early with a series of "harmony meetings" over the State. In both parties the primary campaigning was marked by much bitterness. The "wet and dry" issue loomed immediately. In the primaries of August the avowedly "dry" gubernatorial candidates of both parties were defeated, taking that issue out of the fight for State offices, but the Anti-Saloon League immediately invoked the initiative and forced a con-

stitutional amendment for State-wide prohibition on the ballot.

The Democrats nominated Frederick D. Gardner, author of the Gardner Land Bank bill passed by the Assembly in 1914. This measure appeared on the 1916 ballot as a proposed amendment to the constitution. The Republicans named Henry Lamm, former member of the Missouri Supreme Court. The Progressive party practically disappeared in the State, the only State candidate named being Joseph Fontron, for Governor. As required by Missouri law the candidates of both parties met immediately following the primary and drafted their platforms, stressing the need of reform in State affairs.

The Gardner Land Bank bill immediately became one of the issues of the campaign. It was attacked as weak, useless, and unnecessary in view of the passage of the Federal Farm Loan Act. Throughout the campaign the Republicans urged consideration of State issues, while the Democrats made their fight for the most part on national questions.

The vote for President in the State was: Wilson, 398,032; Hughes, 369,339; Hanly, 3884; Benson, 14,612; Reimer, 902. For Senator, James A. Reed, Dem., 396,166; Walter S. Dickey, Rep., 371,710; O'Hare, Soc., 14,654; Scheidler, Soc. Labor, 962. For Governor: Gardner, Dem., 382,355; Lamm, Rep., 380,092; Fontron, Prog., 4041; Adames, Soc., 14,555; Rogers, Soc. Labor, 946. With one exception the Democratic State ticket was elected, the Republicans winning the State Auditor's office by 9080 votes. The Democrats elected 14 of the 16 Congressmen, two St. Louis districts returning Republicans. Hughes carried St. Louis by 9739 votes, Wilson carrying Kansas City, including Jackson county, by 11,613.

The following constitutional amendments were voted upon: No. 1, concerning pensions for the blind, was carried by 385,627 to 272,908; No. 2, State Land Bank bill, lost by 296,964 to 346,443; No. 3, for prohibition, lost by 294,288 to 416,826.

**STATE OFFICERS.** Governor, Frederick D. Gardner; Lieutenant-Governor, Wallace Crossley; Secretary of State, John L. Sullivan; Auditor, George E. Hackmann; Treasurer, George H. Middelkamp; Attorney-General, Frank W. McAllister; Superintendent of Education, Vel W. Lamkin—all Democrats.

**JUDICIARY.** Supreme Court: Chief Justice, Archelaus M. Woodson; Associate Justices, Walter W. Graves, Robert F. Walker, Charles B. Faris, H. W. Bond, James T. Blair, Fred L. Williams; Clerk, Jacob D. Allen.

**STATE LEGISLATURE.**

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Democrats .....	26	78	104
Republicans .....	8	64	72
Democratic majority ..	18	14	32

**MISSOURI, UNIVERSITY OF.** A co-educational State institution at Columbia, Mo., founded in 1839. The School of Mines is at Rolla, Mo. In the fall of 1916, 2790 students were registered. The enrollment of the summer session was 1320. The faculty numbered 326. The productive funds of the institution amounted to \$1,309,339, and for the fiscal year ending June 30th the total income was \$1,353,766. The library con-

tains 185,000 volumes. President, Albert Ross Hill.

**MISSOURI FLOOD CONTROL.** See FLOODS. **MITCHELL, CHARLES B.** See METHODIST EPISCOPAL CHURCH.

**MITCHELL, LANGDON.** See DRAMA.

**MIWOK.** See ANTHROPOLOGY.

**MOBILIZATION.** See MILITARY PROGRESS.

**MODERN SCHOOL, THE.** Early in 1916 Mr. Abraham Flexner, a secretary of the General Education Board, presented a report entitled "A Modern School." In many particulars the ideas advanced by Mr. Flexner were not new, but the connection of the author with one of the greatest educational agencies in the country served to call attention to these ideas in a very pronounced manner. Various important educational conferences and meetings have had this as one of the topics for definite discussion. A great many articles either favoring or opposing the changes suggested by Mr. Flexner have appeared in periodicals. Altogether it has been one of the most important questions of the past year.

Mr. Flexner gave his conception of modern education by describing a man educated in the modern sense as contrasted with an uneducated man—"uneducated in the modern sense." "In the first place a man educated in the modern sense has mastered the fundamental tools of knowledge; he can read and write; he can spell the words he is in the habit of using; he can express himself clearly orally or in writing; he can figure correctly and with moderate facility within the limits of practical need; he knows something about the globe on which he lives. So far there is no difference between a man educated in the modern sense and a man educated in any other sense. There is, however, a marked divergence at the next step. A man educated in the modern sense will forego the somewhat doubtful mental discipline received from formal studies; he will be contentedly ignorant of things for learning which no better reason than tradition can be assigned. Instead his education will be obtained from studies that serve real purposes. The object in view would be to give him the knowledge he needs and to develop in him the power to handle himself in his own world. Neither historic nor what are called purely cultural claims would alone be regarded as compelling. The curriculum includes nothing for which an affirmative case cannot now be made out."

In describing the curriculum of the proposed "Modern School," Mr. Flexner said in part: "The modern school would drop the study of formal grammar. It would not go through the form of teaching children useless historic facts just because previous generations of children have learned and forgotten them; it would have the courage not to read obsolete and uncongenial classics, simply because tradition has made this sort of acquaintance a kind of good form. Neither Latin nor Greek would be contained in the curriculum—not, of course, because their literatures are less wonderful than they are reputed to be, but because their present position in the curriculum rests upon tradition and assumption. A school trying to produce a resourceful modern type of educated man and woman would provide practical training in one or more modern languages. A realistic treatment of literature would take hold of the child's



normal and actual interests in romance, adventure, fact or what not, and endeavor to develop them into as effective habits of reading as may be. The modern school would, in the same way, endeavor to develop a spontaneous, discriminating, and genuine artistic interest and appreciation—rather than to fashion makers of music and art. It would from the first undertake the cultivation of contacts and cross-connections. Every exercise would be a spelling lesson; science, industry, and mathematics would be inseparable; science, industry, history, civics, literature, and geography would to some extent utilize the same material."

Two questions are raised in connection with the possible results of the proposed system—"the question of discipline, moral and mental, and the question of interest or taste." Advocates of the Modern School feel that "it is absurd to invent formal difficulties for the professed purpose of discipline when within the limits of science, industry, literature, and politics real problems abound. The Modern School would 'discipline the mind' in the only way in which the mind can be effectively disciplined—by energizing it through the doing of real tasks. As to the second question, the Modern School undertakes a large and free handling of the phenomenal world, appealing in due course to the observational, the imaginative, and the reasoning capacities of the child; and in precisely the same spirit and with equal emphasis it will utilize art, literature, and music.

"The education of the particular pupils who attend the Modern School might prove to be the least of the services rendered by the school. More important would perhaps be its influence in setting up positives as against dogmatic educational standards. We go on teaching this or that subject in this or that way for no better reason than that its ineffectiveness or harmfulness has not been established. Medicines were once generally and are still not infrequently prescribed on exactly the same basis. Modern teaching, like modern medicine, should be controlled by positive indications." He further states: "Not only do American children as a class fail to gain either knowledge or power through the traditional curriculum—they spend an inordinately long time in failing. The period spent in school and college before students begin professional studies is longer in the United States than in any other Western country. An economy of two or three years is urgently necessary.

"The inauguration of the experiment here discussed would be at first seriously hampered because of the lack of school paraphernalia adapted to its spirit and purposes. Text-books, apparatus, and methods would have to be worked out—contrived, tentatively employed, remodeled, and tried elsewhere, and so on. In the end the implements thus fashioned would be an important factor in assisting the reorganization and reconstruction of other schools—schools that could adopt a demonstration, even though they could not have made the original experiment.

"Finally, the Modern School, seeking not only to train a particular group of children but to influence educational practice, can be a seminary for the training of teachers, first its own, then others who will go out into service. The difficulty of recruiting a satisfactory staff to begin with must not be overlooked; for available teach-

ers have been brought up and have taught on traditional lines. On the other hand, the spirit of revolt is rife; and teachers can be found whose efforts have already passed beyond conventional limits. With these the new enterprise would be started."

A report previously issued by the General Education Board dealt with American Secondary Education, by Charles W. Eliot. Ex-President Eliot urged that the most important part of education has always been the training of the senses and that the provision for this training in our present educational scheme is inadequate. Our present system of education has been inherited from ancient times and is based chiefly on literature. "A survey of the programmes of the existing American secondary schools—public, private, and endowed—would show that as a rule they pay little attention to the training of the senses and provide little opportunity for the training of the eye, ear, or hand, or any acquaintance with the accurate recording or cautious reasoning which modern science prescribes." The author stated that "the changes which ought to be made immediately in the programmes of American secondary schools, in order to correct the glaring deficiencies of the present programmes, are chiefly: The introduction of more hand, ear, and eye work—such as drawing, carpentry, turning, music, sewing, and cooking, and the giving of much more time to the sciences of observation—chemistry, physics, biology, and geography—not political, but geological and ethnographical geography. These sciences should be taught in the most concrete manner possible—that is, in laboratories with ample experimenting done by the individual pupil with his own eyes and hands, and in the field through the pupil's own observation guided by expert leaders. In secondary schools situated in the country the elements of agriculture should have an important place in the programme, and the pupils should all work in the school gardens and experimental plots, both individually and in cooperation with others. In city schools a manual training should be given which would prepare a boy for any one of many different trades, not by familiarizing him with the details of actual work in any trade, but by giving him an all-around bodily vigor, a nervous system capable of multiform coordinated efforts, a liking for doing his best in competition with mates, and a widely applicable skill of eye and hand. Again, music should be given a substantial place in the programme of every secondary school, in order that all the pupils may learn musical notation, and may get much practice in reading music and in singing. Drawing, both freehand and mechanical, should be given ample time in every secondary school programme; because it is an admirable mode of expression which supplements language and is often to be preferred to it, lies at the foundation of excellence in many arts and trades, affords simultaneously good training for both eye and hand, and gives much enjoyment throughout life to the possessor of even a moderate amount of skill."

In order to put this scheme into operation Ex-President Eliot recommends that the time given to memory subjects and mathematics should be somewhat reduced, that the school day should be lengthened, and that the long summer vacation should be shortened. He states that these changes would add to the annual cost of the

school because more teachers would be required and a larger proportion of them would be men. See also EDUCATION IN THE UNITED STATES.

**MOLTKE, HELMUTH VON.** A German soldier, died in Berlin June 18, 1916, while attending the Reichstag memorial service for Field Marshal von der Goltz. Nephew of the great Moltke, who was so largely responsible for the Prussian success against France in 1870-71, Helmuth von Moltke was born at Gersdorf, Mecklenburg-Schwerin, in 1848. After an education at a realgymnasium, he served in the Franco-Prussian War, and later attended the Kriegsakademie. By 1882 he had become adjutant to his uncle, after whose death in 1891, he was chosen by the Kaiser as his personal aide-de-camp, with the rank of major. His rise was rapid, for he had become a favorite of the Emperor, who, recognizing his abilities, created for him in 1904 a post, that of quartermaster-general on the general staff, previously filled only during war. Two years later he was appointed to succeed General von Schlieffen as chief of the general staff. Instead of furthering the Kaiser's ideas of military training, which laid emphasis on cavalry charges and other spectacular movements, von Moltke proceeded to train the army along the lines that later proved, in the European war, to be characteristic of modern battles, endurance and overwhelming pressure, rather than swift action. That the German army had ready for instant use such remarkable equipment at the opening of the great war was largely due to Moltke's efforts; in 1913 alone he had procured the grant of \$250,000,000 for army expenditure. Von Moltke was chief of the general staff only during the first months of the war, till December, 1914, when he was succeeded by General Falkenhayn. However, from the beginning of the next year till his death, he served as chief of the supplementary general staff. The reason for his retirement from active command was given as illness, but it was generally believed that in several instances his views had failed to coincide with the Kaiser's on important strategic questions, and that the Chief had refused to yield. The dash toward Paris had been of Moltke's planning, and when this was repulsed, he favored pressure on the region around Verdun, rather than the effort, advocated by the Kaiser, to press back the Allies' lines in Flanders and reach Calais. His adherence to Christian Science was regarded by German military circles as a weakness.

**MONACO.** A constitutional European monarchy, occupying 1.5 square kilometers; population, 19,121. The city of Monaco has 2410 inhabitants, La Condamine 6218; Monte Carlo, 3794. No creed but Roman Catholicism is tolerated. There is no cultivation. The revenue is chiefly derived from the gaming concession at Monte Carlo. The constitution dates from Jan. 5, 1911. The reigning prince (house of Goyonde-Matignon-Grimaldi) is Albert, born 1848, came to the throne 1889. He married in 1869 Lady Mary Douglas-Hamilton (mother of the heir-apparent, Louis, born 1870). This marriage being dissolved in 1880 he married Alice, dowager Duchess of Richlieu (née Heine); this union was also dissolved (1902).

**MOND, SIR ALFRED M.** See GREAT BRITAIN, Government.

**MONGOLIA.** A vast Chinese dependency lying west of Manchuria and between China proper

and Siberia. Neither area nor population is definitely known; the former is estimated at 1,076,292 square miles, while the estimated number of inhabitants is 1,800,000. Higher estimates for both area and population have been published. The country consists of Inner Mongolia, at the south, and Outer Mongolia, at the north. After the outbreak of the Chinese revolution, Outer Mongolia declared its independence, having apparently the support of Russia. In the autumn of 1913, an agreement was reached between China and Russia, whereby China recognized the autonomy of Outer Mongolia and Russia recognized Chinese suzerainty therein.

**MONITORS (FOR BRITISH NAVY).** See NAVAL PROGRESS.

**MONTANA. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 466,214. The population in 1910 was 376,053.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn ..... 1916	74,000	1,850,000	\$1,720,000
..... 1915	70,000	1,960,000	1,852,000
Wheat ..... 1916	1,485,000	28,655,000	46,184,000
..... 1915	1,590,000	42,180,000	82,900,000
Oats ..... 1916	660,000	25,080,000	11,788,000
..... 1915	600,000	31,200,000	9,984,000
Potatoes ... 1916	39,000	4,875,000	5,850,000
..... 1915	39,000	6,045,000	3,022,000
Hay ..... 1916	825,000	1,402,000	15,422,000
..... 1915	775,000	1,550,000	11,625,000
Eye ..... 1916	10,000	205,000	197,000
..... 1915	10,000	225,000	146,000
Barley ... 1916	95,000	2,650,000	2,022,000
..... 1915	80,000	2,720,000	1,806,000
Flaxseed ... 1916	325,000	3,088,000	7,658,000
..... 1915	250,000	2,625,000	4,462,000

<sup>a</sup> Tons.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments ....	677	989
Average number of wage earners	11,655	13,704
Capital invested .....	\$44,588,000	\$79,246,000
Wages .....	10,901,000	13,001,000
The value of materials used..	49,180,000	46,744,000
The value of products.....	73,272,000	84,446,000

**MINERAL PRODUCTION.** The value of the output in gold, silver, copper, lead, and zinc in 1916 was over \$145,000,000, which is greater than that of any previous year, and an increase over 1915 of over \$62,000,000, or nearly 76 per cent. There was a decrease in the output of gold, but an increase in all other metals. The mined output of gold was valued at \$4,635,000, a decrease of nearly 14 per cent from \$5,400,195 in 1915. The output of silver increased from 14,378,437 ounces in 1915 to 16,686,000 in 1916. The value on account of better prices increased from \$7,298,868 to \$10,979,000, or nearly 51 per cent. The mined production of copper increased from 267,231,014 pounds in 1915 to 357,000,000 pounds in 1916, or an increase of nearly 90,000,000 pounds. The increase in value was proportionally more owing to the unusually high price from \$46,765,427 to \$97,461,000, an increase of

over 108 per cent. The mined output of lead increased from 13,756,456 pounds in 1915 to 16,933,000 pounds in 1916, a gain of over 3,000,000 pounds. The value of the output was nearly double, increasing from \$646,549 in 1915 to over \$1,151,000, or 78 per cent. The mined production of zinc increased from 187,146,895 pounds in 1915 to 227,000,000 in 1916, an increase of nearly 40,000,000 pounds. The value of the output increased from \$23,206,215 in 1915 to \$31,099,000, or 31 per cent.

The coal production of the State in 1915 was 2,789,755 short tons, valued at \$4,526,509, which was almost exactly equal to the production of 1914. There were employed in the coal mines of the State in 1915 3350 men, compared with 3158 in 1914. The mining of metal for 1915 was a record for the State.

In September President Wilson restored to entry 1,892,468 acres of land in the northern and northeastern parts of the State. This land was theretofore included in coal withdrawals. A large part of it had been under the homestead and other non-mineral land laws. The entire restored area has been classified by the Geological Survey. Areas classified as coal are open to absolute sale and entry under the coal land laws.

**TRANSPORTATION.** The total railway mileage of the State in 1915, the latest date for which figures are available, was 4806. These include main track only. The roads having the longest mileage are the Great Northern 1698, Northern Pacific 1464, Chicago, Milwaukee, and St. Paul 1056.

**EDUCATION.** The latest statistics for education available are for 1914. The number of pupils enrolled in that year was 85,782. Of these 43,046 were males, and 42,736 females. The average daily attendance was 62,686. The total number of children of school age in 1913, when the latest census was taken, was 114,032. The total number of teachers was 3778 in 1914, of whom 3252 were females, and 526 males. The average monthly salary of male teachers was \$93.29, and of females \$75.55. The total receipts for educational purposes for the year ending Aug. 31, 1914, were \$6,951,903.

**FINANCE.** The latest statistics available for the State are for the year ending June 30, 1914. During that year there were aggregate receipts to the amount of \$5,550,909, and the disbursements amounted to \$5,207,011. At the beginning of the year there was a balance of \$1,039,749, and at the end, of \$1,383,646.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions of the State include the State Prison at Deer Lodge, the State Industrial School at Miles City, a home for orphans, foundlings, and destitute children at Twin Bridges, a Soldiers' Home at Columbia Falls, the State Hospital for the Insane at Warm Springs, and the State School for the Deaf and Blind and Feeble-Minded at Boulder.

**POLITICS AND GOVERNMENT.** As a result of the election of 1916, the distinction came to Montana of sending the first woman to the Congress of the United States. Miss Jeannette Rankin of Missoula was chosen to the national House of Representatives as one of the two members from the Treasure State. She was elected as a Republican. Miss Rankin has been the State's most active worker for woman suffrage and it was due largely to her efforts that

the right to the ballot was granted her sex in Montana. She is a resident of Missoula, which city also is the home of Congressman John M. Evans, Montana's two Congressmen being elected at large. Congressman Evans is a Democrat, and has served two terms in the House.

President Wilson carried the State by a vote that illustrates the growth of Montana during the last four years, although the great increase is partially accounted for by the granting of the franchise to women. At the last election, President Wilson received 22,000 more votes than were cast for all presidential candidates four years ago. In 1912 his vote was 27,941; in 1916, 101,063. The vote for Hughes was 66,750; in 1912 Roosevelt received 22,456, Taft 18,512, Debs 10,885. There were almost 100,000 more votes cast for President in 1916 than at the previous election.

Montana has joined the ranks of the dry States. The vote for prohibition was 102,776, against 73,890. By act of the last Legislature by which the question of prohibition was referred to the people, it was provided that if carried it should go into effect on Jan. 1, 1919. The referendum to permit boxing under a commission was defeated, 76,510 to 71,562.

While the electorate gave its vote to the Democratic candidate for President and reelected Senator Henry L. Myers, Democrat, to the upper branch of Congress, it divided its preference for State officials, electing six Republicans and four Democrats. Gov. S. V. Stewart was reelected after one of the hardest gubernatorial campaigns the State has ever known, as was Lieut.-Gov. W. W. McDowell. Both are Democrats.

The official vote for candidates for President and Senator was as follows:

President—Wilson (D), 101,063; Hughes (R), 66,750; Benson (S), 9564.

United States Senator—Henry L. Myers (D), 85,580; Charles N. Pray (R), 72,753; Henry La Beau (S), 9292.

**STATE OFFICERS.** Governor, Samuel V. Stewart; Lieutenant-Governor, W. W. McDowell; Secretary of State, Charles T. Stewart; Attorney-General, S. C. Ford; Adjutant-General, Phillip Greenan; Treasurer, H. L. Hart; Auditor, W. Keating; Superintendent of Public Instruction, \_\_\_\_\_; all Democrats.

**JUDICIARY.** Supreme Court: Chief Justice, Theo. Brantly; Justices, Sydney Sanner, William L. Holloway; Clerk, J. T. Carroll.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Democrats .....	14	49	63
Republicans .....	27	46	73
Majority .....	13 R	3 D	10 R

**MONTANA, UNIVERSITY OF.** A State co-educational institution at Missoula, Mont. In the fall of 1916 there were 601 students and 60 faculty members. H. E. Smith (commerce and accounts), Walter Pope (law), George Clarey (law), and Ralph Casey (journalism) were added to the faculty. The income is obtained from State appropriations. The library contains 30,000 volumes.

**MONTENEGRO.** One of the Balkan states overthrown by the German invasion of 1915; a constitutional (1905) hereditary European monarchy, lying between the Herzegovina and

Albania and having an outlet on the Adriatic Sea. The area, previous to the wars in the Balkans, was 9080 square kilometers (3506 square miles). By the conclusion of the treaty of Bucharest, Montenegro gained the western portion of the sanjak of Novibazar, Ipek, and Jakova—territories estimated to cover 2130 square miles. The original population numbered about 285,000 (31 to the square kilometer); the population of the new territories is estimated at 150,000. The majority of Montenegrins belong to the Greek Orthodox Church. Cetinje, the capital, has 5300 inhabitants (exclusive of the garrison); Podgoritsa, 10,053; Dulcigno, 5081; Niksbich, 4972; Antivari, 2371; Niégosh, 1890; Riéka, 1557; Danilovgrad, 1125; in the new territories, Diahobitza, 14,050.

Montenegro is well adapted for grazing; considerable herds roam the mountain pastures. Some crops are raised, corn, potatoes, and tobacco being among the most important. Much of the country is heavily forested. The chief products and exports are hides, wool, horses, cattle, olive oil, sheep, etc. The exports for 1911 were valued at 2,392,000 kronen; in 1909, at 2,435,550 kronen. The imports for 1911 were valued at 8,167,000 kr. (6,181,369 kr. in 1909). A railway (18 kilometers) runs from Antivari to Lake Scutari. Telegraph lines 850 km.; stations, 24; post offices, 21. The budget for 1914 estimated the receipts at £390,000 and the expenditure at £504,000. The public debt amounts to 9,500,000 kr.

Nicholas I (born Oct. 7, 1841), the reigning monarch, succeeded his uncle, Prince Danilo, who was assassinated August, 1860; he married in the same year Princess Milena, daughter of the voyvode Peter Voucotich. He took the title of king in 1910. Heir-apparent, Prince Danilo, born June 29, 1871, and married (1899) to the Duchess Jutta of Mecklenburg-Strelitz.

After the downfall of his kingdom, the King went to Italy and afterwards to France on January 24th, when the government was transferred to the city of Bordeaux. The head of the government was Lazare Mouchevovitch. The King, in an open letter of May 22nd, repudiated six Montenegrin ministers who remained in Montenegro, and also the King's son, who either as a guest or as a prisoner, was in Vienna. In July, an insurrection under General Vischovitch against the Austrian authorities was reported.

**MONTSERRAT.** A presidency of the LEEWARD ISLANDS (q.v.).

**MOON.** See ASTRONOMY; METEOROLOGY.

**MOORE, EDWARD.** An English clergyman, educator, and scholar, died Sept. 2, 1916, at Chagford, Devonshire. He was born in Cardiff. At Pembroke College, Oxford, he took high honors, and after his graduation was fellow and tutor of Queen's College; was identified with the university actively for most of his life, and as principal of St. Edmund Hall from 1864 to 1913. Of both Pembroke and Queen's he became honorary fellow. In 1903 he was appointed canon of Canterbury Cathedral. Recognition of his scholarly achievements brought him election to the Accademia della Crusca and the British Academy and an honorary D. Litt. from Dublin. Except for editions of Aristotle's *Ethics and Poetics*, Dr. Moore confined himself to writing on Dante, his works including, among others,

three series of *Studies in Dante*, *Contributions to the Textual Criticism of the Divina Commedia* (the most important of all), and the *Oxford Dante*. He initiated the Oxford Dante Society.

**MOORE, GEORGE.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, English.

**MOORE, JAMES HOBART.** An American capitalist, died at Lake Geneva, Wis., July 18, 1916. Born at Berkshire, N. Y., in 1852, he became a bank clerk at Binghamton (N. Y.) at 19, and two years later settled in Chicago, where he was admitted to the bar in 1881. With his brother, Judge William H. Moore, he became identified with large business interests. The two got control of the Diamond Match Company and endeavored to corner the market, a proceeding that led to a panic and the closing of the Chicago Stock Exchange. Later they made a fortune in the National Biscuit Company, and bought up the Rock Island railway system. Four great steel corporations formed by them, with a combined capital of \$187,000,000 and known as the "Moore group," were finally absorbed by the United States Steel Corporation, in the formation of which the Moores were conspicuous. They also acquired large interests in the American Can Company. James H. Moore had a home at Santa Barbara, Cal., but his business address remained Chicago.

**MORAL EDUCATION.** See EDUCATION IN THE UNITED STATES.

**MORAVIA.** A crownland of Austria. For area and population, see AUSTRIA-HUNGARY.

**MORAVIAN CHURCH.** See MORAVIANS.

**MORAVIANS,** also called **MORAVIAN BODIES,** **UNITED BRETHREN** (Unitas Fratrum), and the **MORAVIAN CHURCH.** There are two bodies of this denomination in the United States, but only one which is important numerically. The smaller body is called the Union Bohemian and Moravian Church. It had in 1915, 1000 communicants, 21 churches, and 4 ministers. The main body, the Moravians, had in 1916, 20,569 communicants, 126 churches, and 145 ministers. Missions are maintained in nearly all parts of the world, and the educational institutions under the control of the Moravians have a high reputation for efficiency. The latter include the Moravian College and Theological Seminary, the Moravian Parochial School for Boys and Girls, and the Moravian Seminary and College for Women at Bethlehem, Pa., Linden Hall Seminary for Girls at Lititz, Nazareth Hall for Boys at Nazareth, Pa., and an academy for girls and a college for women at Salem, N. C. The Moravians are strongest in Pennsylvania.

**MOROCCO.** The largest of the Barbary states; an African sultanate under French protection by virtue of the treaty of March 30, 1912 (ratified without reservation by Germany in 1913), except for the area conceded to Spain, and Tangier, which is to be internationalized. The Spanish concessions cover an area of 21,800 square kilometers carrying a population of about 404,000; Tangier, 600 square kilometers, 60,000 inhabitants. The French protectorate has an area of 416,800 square kilometers and an estimated population of 3,000,000. Jews number about 150,000; Europeans (1910), 19,243. There are three capitals—Fez, with 102,125 inhabitants; Morocco (Marakech), 87,120, and Mequinez. Mogador, an important port, has

22,000 inhabitants: Casablanca (Spanish), 42,000; Tetuan (Spanish), 43,000; Rabat, 60,200; Tangier, 46,270. Berbers, Tuaregs, and Bejaouin and Mued Arabs are among the chief elements of the population; roving bands wage war among themselves and with their European rulers. Agriculture is undeveloped and the abundant mineral resources remain unexploited. Carpets and slippers are manufactured. The trade was rated for 1914 at £9,257,527 imports and £1,515,253 exports. Chief articles of export follow, with values in thousands of pounds sterling: Wool, 175,007; almonds, 101,535; linseed, 136,120; barley, 1692; fenugreek, 42,141; canary seed, 76,012; etc.

There are no authentic figures for Moroccan finance. The customs duties at the seven ports amount to about 12,500,000 francs. The sultan's budget is placed at about 7,000,000. The Sultan is an absolute spiritual and temporal despot. He and his subjects belong to the Malekite sect of the Sunnite Mohammedans. The reigning Sultan is Mulai-Yussuf, proclaimed at Fez Aug. 17, 1912, in place of his deposed brother, Mulai Abd-el-Hafid, who had succeeded another brother, Mulai Abdul, deposed in 1908. All are sons of Mulai Hassan (1873-1894). French resident commissioner-general, Gen. H. Lyautey, appointed April 28, 1912; Spanish high commissioner (at Tetuan), General Jordana, appointed July 9, 1915.

Toward the beginning of the year the French forces, under General Henrys, put down the movement of tribesmen in the Taza region, captured the camp of the leader Abdel Malek and drove him into the mountain region of Rif. General Jordana announced the complete overthrow of all hostile movements in the Spanish zone on May 17th, owing to the victory of Raisuli, Spain's ally, over the enemy. Fighting with the insurgents was reported to have recommenced in June, but by the end of the month the Spanish troops were said to have put down the revolt. Italy in March definitely renounced the privileges she had possessed under the capitulations in the French zone and in April took the same course in regard to the Spanish zone. The Netherlands and several other nations followed this example.

**MORRIS PLAN BANKS.** See **LOAN SHARKS.**

**MORTALITY STATISTICS.** See **VITAL STATISTICS.**

**MOSBY, JOHN SINGLETON.** An American Confederate soldier, died May 30, 1916, in Washington, D. C. Born in Powhatan County, Va., Dec. 6, 1833, he was engaged in the practice of law at the opening of the Civil War. Mosby enlisted in the First Virginia Cavalry, and by 1862 had become adjutant. His spare time was occupied in study of tactics and military history, and he became convinced of the value of raids upon the rear of the enemy. When a scout under Gen. J. E. B. Stuart, after an exploit in which he penetrated clear behind the Union lines, he gained permission to lead a band of guerrillas, known as Mosby's Partisan Rangers. With these he made as much trouble as possible for the enemy by cutting communications, destroying supply trains, and capturing outposts; and he came to be greatly feared by the Northern army, for it was never known where he would strike next. One of Colonel Mosby's most famous achievements was the cap-

ture, in March, 1863, of General Stoughton at his headquarters at Fairfax Court House, Va., where he was surrounded by his troops. Only 29 men accompanied him on this expedition. The next year, by harassing Sheridan's forces in the Shenandoah Valley, he prevented the cutting of Lee's communications with the South. By December, 1864, he had become colonel. At the close of the war, General Hancock refused to accept Mosby's surrender, on the ground that he was not properly an officer in the Confederate army, and it is said that if it had not been for General Grant's intervention, the famous raider would have been hanged. Mosby was one of the earliest Southerners to abandon animosity toward the North after the war. He became a Republican, actively supported Grant for President in 1872, and, by Hayes, was appointed consul at Hongkong in 1878. This post he held till 1885. Subsequently he was counsel for the Southern Pacific Railroad, a special land agent for the government in Colorado, and (1904-10) an assistant attorney in the Department of Justice at Washington. He wrote *Mosby's War Reminiscences and Stuart's Cavalry Campaign* (1887) and *Stuart's Cavalry in the Gettysburg Campaign* (1908).

**MOSQUITOES.** See **MALARIA.**

**MOTHERS' PENSIONS.** See **PENSIONS FOR MOTHERS.**

**MOTION PICTURES.** See **MOVING PICTURES.**

**MOTON, ROBERT RUSSA.** See **TUSKEGEE INSTITUTE.**

**MOTOR BOATING.** See **YACHTING.**

**MOTOR FUEL.** See **AUTOMOBILES; CHEMISTRY, INDUSTRIAL; PETROLEUM.**

**MOTOR VEHICLES.** See **AUTOMOBILES.**

**MOUNET-SULLY, JEAN.** A French actor, died in Paris March 3, 1916. He was born at Bergerac, Department of the Dordogne, Feb. 27, 1841. At 21 he went to Paris to enter the Conservatoire, against the wishes of his family, and there he studied under the great teacher Bressant, in 1868 winning the first prize in tragedy. In that year he made his debut at the Odéon, playing in *King Lear* with Mme. Sarah Bernhardt, without, however, any striking success. When the Franco-Prussian War broke out he was accepted as an officer in the Gardes Mobiles, and he so distinguished himself that he came near deciding on a military career. However, in 1872, he was offered the opportunity to play Orestes in Racine's *Andromaque*, at the Théâtre Français, at once gaining attention by his brilliant acting. From that time he was connected with this theatre, of which he became a *sociétaire* in 1874, and at the time of his death he was dean of the company. Mounet-Sully acquired a wide range of tragic rôles; his repertoire included plays by Sophocles, Racine, Corneille, Shakespeare, and Victor Hugo. Probably he will be longest remembered for his impersonation of Oedipus in a French version of *Oedipus Rex*, first produced at the old Roman amphitheatre at Orange in 1888. Afterward he played Hamlet, but with this he did not succeed in London, his interpretation (according to Jules Lemaitre modeled on Goethe's conception) failing to impress English audiences. Among the other notable parts that he took were Achilles in Racine's *Iphigénie en Aulide*, Xiphareas in *Mithridate*, Orosmane in *Zaire*, Hippolytus in *Phèdre*, the title parts in Victor Hugo's *Hernani* and *Ruy*

*Blas*, and Francis I in Hugo's *Le Roi S'Amuse*. The last named play had been banned 50 years before (1832) by Louis Philippe, but its revival gave Mounet-Sully one of the greatest triumphs of his career, as did the same author's *Marion Delorme*. During 1885 Mounet-Sully temporarily abandoned the stage, to lecture on contemporary French poets. In 1894 he appeared in repertoire in the United States, after touring through Europe. He wrote several plays, among them *La Vieillesse de Don Juan* in verse, presented at the Odéon in 1906. He was made an officer of the French Academy and a chevalier of the Legion of Honor. Mounet-Sully was accounted one of the greatest tragic actors of his day, equipped by nature with all the physical and mental attributes essential to powerful portrayal of character, and thoroughly trained in the art of the theatre.

**MOUNTAIN FEVER.** See **ROCKY MOUNTAIN SPOTTED FEVER.**

**MOUNT HOLYOKE COLLEGE.** A non-sectarian institution for the education of women, at South Hadley, Mass. It received its charter as a college in 1888, and before that had been Mount Holyoke Seminary. In the fall of 1916, 824 students were registered. The faculty numbered 96, and there was an additional staff of 50 administrative officers, etc. As substitute for Professor Hayes, of the department of psychology, who was granted leave for research work, Dr. Coffin came from Earlham College. During the year, by bequest and by gift, \$20,842 was received. The new Student-Alumnæ Hall, costing \$140,000, was opened. It contains auditorium, banquet rooms, committee rooms, etc. The productive funds of the college amount to \$1,419,251; the institution in 1916 drew an income of \$66,410. The number of volumes in the library was 61,212. President, Mary Emma Woolley. See **UNIVERSITIES AND COLLEGES.**

**MOUNT WILSON SOLAR OBSERVATORY.** See **ASTRONOMY.**

**MOVING PICTURES.** The year 1916 saw increasing development in the field of moving pictures. As always, statistics of the industry were difficult to obtain, and the ostensibly reliable statistics did not show any increase in the number of moving picture theatres in the United States. Even without the aid of statistics, however, it was evident upon slight investigation that the magnitude of the interests concerned and the amount of capital invested in the industry experienced an enormous increase. As an instance of the first portion of this statement it may be mentioned that in New York City, one well-known producer of motion pictures stated that there were 729 theatres for the exhibition of pictures at the end of the year. Another exhibitor, whose opinion presumably carried the same weight, stated before a legislative committee that had been authorized for the purpose of considering the taxation of the industry that there were only 530 such theatres in greater New York. This latter figure also was contrasted at this hearing with the effect that three years ago there were 1089 moving picture theatres in the greater city. It was still impossible to obtain, as above mentioned, the exact estimate of the amount of capital invested in the producing, distributing, and exhibiting divisions of the motion picture industry. In California alone, where, as is well known, owing to the climate and other local conditions, a large number

of producing studios were located, it was estimated that the sum of \$15,000,000 was invested in studios and apparatus. A noticeable tendency of the year was the gradual coöperation and combination of all those interested in the business into various associations. One of the largest of these, including all branches of the industry, was the National Association of the Motion Picture Industry. The need of some such bodies had been recognized for some time, but such a diversity of interests and tendencies had been shown, and so much money had been made by a few individual producers and companies that it had been difficult to bring them to the point of recognizing their common interests by the formation of an organization. Like other industries, the production and exhibition of moving pictures has been obliged to conform to the general principles of supply and demand, as well as to submit to the imposition of local laws and regulations, such as building and fire protection laws, regulations in regard to the admission of young children to the theatres, the question of censorship, and finally that of local taxation, which last is still in an unsettled state. Many of the exhibitors who could command only a limited amount of capital, or who had neither the ability nor foresight to discriminate in the choice of films or film plays, were unsuccessful financially. Thus a reduction in the number of theatres in many places was accounted for. At the same time also it should be noted that a larger amount of capital was invested in the exhibition of pictures than in the production or distribution of them. Formerly this was not so, since many of the more expensive film productions were shown on the screen in theatres that had been used for the legitimate drama. The small theatres usually were not able to afford the hiring of the better or more artistic class of films. As the number of productions increased, however, and an enlightened public taste began to make itself felt, a distinctly new class of theatre was built. Many houses of this type were designed without any regard to the possible future production of stage plays, thus giving evidence of the belief of the backers of such enterprises in the permanence of film plays. As was mentioned in the 1915 YEAR BOOK, the censorship of film plays was in an unsettled condition. Several States had boards of censorship, many more were legislating on the subject, and there was a pronounced movement on foot to obtain a national or Federal board of censors. This state of affairs in the industry at the beginning of 1916 continued practically throughout the year. While nothing was accomplished, the consensus of opinion among the producers and exhibitors was distinctly against censorship of any kind, on the ground that the activity of local police and other municipal officers would always be competent to deal with questionable or distinctly unmoral plays.

In looking over the progress of the year, one sees, as formerly, great variety in the quality of the plays which the public appears to enjoy. There was decided progress in the production of important dramas adapted for the screen, which will be referred to later on. In the average moving picture house, however, there did not seem to be any improvement in either the artistic quality or educational value of the average films exhibited. The same themes as formerly, carrying the same kind of appeal were shown



**MOVING PICTURE OPERATORS IN A FOREST OF THE VOSGES AT THE SCENE OF AN ARTILLERY DUEL**



**TAKING MOVING PICTURES FROM A TRENCH**  
French Official Photographs from Jacques Boyer, Paris  
**MOVING PICTURES IN THE WAR**





with unflinching regularity; and while many of them affected to excuse their existence by reason of a wholesome moral effect, it seemed unlikely that the effect, particularly on young persons, of many of the plays could be anything but bad. A play depicting the career of a criminal, for example, while it usually concluded with the bringing of the latter to justice, was so full of the antecedents of the principals, and the commission of the crime itself as usually to distract the attention of the young observer from the true end to be accomplished by it. The same criticism holds good with regard to the large number of film plays concerned with subjects that were of questionable expediency, particularly for exhibition before minors. Many of these so-called problem plays and others of that sort intended to teach some moral lesson, were not usually presented in such a form as to accomplish their object. It was for reasons of this sort that such a strong attempt was made to establish boards of censorship. At the meetings of the producers, the subject was discussed very fully, and naturally there was great difference of opinion; some of the members holding that they must give the public the kind of films that the public was supposed to demand; others again with different standards before them were earnestly endeavoring to raise the quality of screen plays through the improvement of subjects and in the methods of presentation.

One of the notable advances of the year was the improved photographic results obtained, many of the films depicting scenes that required considerable stretch of the imagination to understand as having actually taken place. Not only was more skillful photography observable, but considerable ingenuity was shown in the choice of scenes and surroundings. Earnest attempts were made to manufacture non-inflammable films, but while fires in moving picture theatres, due to this cause, were fortunately becoming quite infrequent, a thoroughly satisfactory non-inflammable film was yet to be produced.

Among the important dramas shown during the year was "Intolerance," produced by D. W. Griffith, which promised to have almost as successful a run as his "Birth of a Nation." Geraldine Farrar was featured in a film depicting events in the life of Joan of Arc, entitled "Joan the Woman." A film which attracted wide attention on account of dealing with the war topic was "Civilization," produced by Thomas H. Ince, and probably the most spectacular feature of the year was a screen version of Jules Verne's *20,000 Leagues Under the Sea*, which was considered a masterpiece of ingenious photographic technique. In spite of the war, exhibitions of moving pictures were held in many of the European cities. Some of the films were American, and others French and Italian. South American countries showed an increasing demand for amusement of this sort. In fact, in all parts of the world there came a gradual but certain recognition of moving pictures as a distinct form of amusement, entertainment, and education entirely separate from the spoken drama, which at one time it had been supposed would be displaced by the film.

The European war furnished increasing opportunities for photographing important campaigns and individual achievements that were subsequently used for moving picture exhibition, and not the least important of these was

a series of films depicting the work of the American Ambulance Corps in France. A number of these films were widely exhibited in the United States, not only for the purpose of showing the invaluable work performed by American volunteers in this hazardous branch of the service, but in order to arouse interest that would result in greater financial support to maintain it. Some excellent films were also obtained showing the operations of various kinds of aircraft. See also CHILD LABOR.

**MULRY, THOMAS M.** An American banker and leader in charitable work, died in New York City March 10, 1916. He was born in New York in 1856 and studied there at Cooper Union and at the De La Salle Institute. In 1871, after returning from some years in Wisconsin, Mr. Mulry joined his father in the contracting business, and with this he remained identified until 1906, when he was elected president of the Emigrant Industrial Savings Bank. He was also a trustee of the Mutual Life Insurance Company, and a director of the United States Title Guaranty Company. In addition he had been prominent in civic life, but although long identified with Tammany Hall, as a member of its general committee, he never consented to run for office. Mr. Mulry was principally known for his activity in various charitable organizations, Catholic and non-sectarian. He had been a president of the National Conference of Charities and Corrections, and a commissioner on the New York State Board of Charities, and was president of the St. Vincent de Paul Society. The Lætare medal of the University of Notre Dame was conferred on him in 1912, and Pope Pius X made him a knight of the Pontifical Order of St. Gregory the Great.

**MUNICIPAL GOVERNMENT.** In many American cities interest had shifted from the commission plan to the city manager plan during 1916 and the few years preceding. Meanwhile, the number of commission-governed cities continued to increase, although not so rapidly as before. A large percentage of the cities that had adopted the manager plan had coupled it with commission government, as was proposed in the model city charter of the National Municipal League (see YEAR BOOK for 1915). There was no official register of commission plan cities, and as this form of government had become an old story its adoption was not heralded as it formerly was. Much publicity was given to the adoption of the manager plan, but reporting it was voluntary. Moreover, there were differences of opinion as to just what constitutes a commission city or a manager city. All these things make it impossible to give complete lists of cities under the two plans. Tentative lists are presented, that for commission cities being a combination of a part of the data given in the INTERNATIONAL YEAR BOOK for 1913, 1914, and 1915, together with a list of 25 cities recorded by the National Municipal League as having adopted commission government in 1916. The commission plan list possesses unusual interest because it was 15 years since the plan was first adopted, in a primitive form, at Galveston, Texas, in 1901. The table includes 495 places, located in 41 States. In five of these States there are 30 or more cities listed, Texas alone having 53, Illinois 46, Kansas 43, New Jersey 37, and Pennsylvania 30. By years the adoptions have been as follows:

1901	1	1912	67
1905	1	1913	112
1906	0	1914	45
1907	7	1915	39
1908	5	1916	25
1909	23	Unknown	7
1910	66		
1911	96	Total	595

The cities reported as having voted for commission government in 1916 are as follows (for populations of these cities see the large table):

Allenhurst, N. J.	Salem, Ill.
Lambertville, N. J.	Ann Arbor, Mich.
Montclair, N. J.	Bessemer, Mich.
West Hoboken, N. J.	Green Bay, Mo.
Daytona, Fla.	East Aurora, Iowa.
Centralia, Ill.	Fredonia, Kan.
Chenoa, Ill.	Kearney, Neb.
Chrisman, Ill.	Mena, Ark.
East Peoria, Ill.	Roby, Texas.
Mt. Carmel, Ill.	Sinton, Texas.
Newton, Ill.	Butte, Mont.
Oregon, Ill.	Helena, Mont.
Olney, Ill.	

Presumably other cities adopted the plan in 1916 and doubtless some cities have found their way into the large table that do not belong there, but in round numbers it may be said that 500 cities or towns adopted the commission plan in the 15 years ended with 1916. The high-water mark was reached in 1913, when 112 cities were reported as having voted for commission government. Denver abandoned the commission plan early in 1916, as perhaps two or three smaller places had done at earlier dates.

The accompanying list of city-manager cities and towns includes 100 places, but comes down only to November, 1916.

In the latter part of the year two elections were held on a radical change in the charter of Springfield, Mass. At the first election the voters decided by 330 majority out of 10,912 votes for the Federal as opposed to the city manager plan. The second election was on the repeal of the old charter and the adoption of the Federal plan. The decision was for retaining the old charter, the majority being 2219 out of a total of 11,769 votes. Pasadena, Cal., decided by a small majority against having a city manager, but it already had commission government.

A Municipal Week was held at Springfield, Mass., late in November, with conventions of the National Municipal League, the City Managers' Association, and various other organizations.

**Bibliography.** New publications in 1916 included: H. L. Bain, *The Law and Practice of Municipal Home Rule* (New York); W. B. Munro, *Principles and Practice of Municipal Administration* (New York); C. P. Huse, *The Financial History of Boston* (Cambridge, Mass.); *General Statistics of Cities, 1915*, and *Financial Statistics of Cities, 1915* (Washington, D. C.); "The Purposes of the Indebtedness of American Cities, 1880-1912" (July issue of *Bulletins*, Bureau of Municipal Research, New York City). See also articles in this YEAR BOOK ON CITY PLANNING; GARBAGE AND REFUSE DISPOSAL; ROADS AND PAYMENTS; SEWAGE AND SEWAGE TREATMENT; WATER WORKS AND WATER PURIFICATION.

CITIES REPORTED AS HAVING ADOPTED THE COMMISSION PLAN OF GOVERNMENT, 1901 TO 1916

Name of Place	Population	Name of Place	Population
<b>MAINE—1</b>			
Gardiner	5,311	Cumberland	21,839
<b>MASSACHUSETTS—7</b>			
Gloucester	24,398	Bluefield	11,188
Haverhill	44,115	Fairmont	9,711
Lawrence	85,898	Grafton	7,568
Lowell	106,294	Huntington	31,161
Lynn	89,339	Parkersburg	17,842
Salem	43,697	<b>NORTH CAROLINA—8</b>	
Taunton	34,259	Asheville	18,762
<b>CONNECTICUT—1</b>			
Bridgeport	102,054	Greensboro	15,895
<b>NEW YORK—5</b>			
Beacon	10,629	Hickory	8,716
Buffalo	423,715	High Point	9,525
Mechanicsville	6,684	Linc'nton	2,418
Niagara Falls	30,445	Morgantown	2,712
Saratoga Springs	12,693	Raleigh	19,218
<b>NEW JERSEY—37</b>			
Allenhurst	306	Wilmington	25,748
Ashbury Park	10,150	<b>SOUTH CAROLINA—5</b>	
Atlantic City	46,150	Columbia	26,311
Bayonne	55,545	Florence	7,057
Belleville	9,891	Orangeburg	5,906
Beverly	2,140	Spartanburg	17,517
Bordentown	4,250	Sumter	8,109
Bradley Beach	1,807	<b>GEORGIA—3</b>	
Cape May	2,471	Cartersville	4,067
Deal Beach	8,400	Marietta	5,949
Haddonfield	4,142	Rome	12,099
Hawthorne	3,400	<b>FLORIDA—12</b>	
Hoboken	70,324	Apalachicola	3,065
Irrington	11,877	Daytona	3,082
Jersey City	267,779	Green Cove Springs	1,319
Lambertville	4,657	Lakeland	3,719
Long Branch	13,298	Largo	291
Longport	118	Orange Park	372
Madison	4,658	Orlando	3,894
Margate City	129	Pass & Grille	
Millville	12,451	Pensacola	22,892
Montclair	21,550	St. Petersburg	4,127
New Brunswick	23,888	Tampa	37,782
Nutley	6,009	West Palm Beach	
Ocean City	1,950	<b>ALABAMA—12</b>	
Orange	29,630	Birmingham	132,685
Passaic	54,773	Carbon Hill	1,627
Phillipsburg		Cordova	1,747
Ridgefield Park	966	Elba	1,079
Ridgewood	5,416	Florence	6,689
Sea Isle City	551	Hartselle	1,374
Trenton	96,815	Huntsville	7,611
Union	21,023	Mobile	51,521
Vineland	5,282	Montgomery	38,136
Wallington	3,448	Sheffield	4,865
West Hoboken	35,403	Talladega	5,854
Wildwood	898	Tuscaloosa	8,407
<b>PENNSYLVANIA—30</b>			
Allentown	51,913	Charleston	2,000
Altoona	52,127	Clarksdale	4,079
Beaver Falls	12,191	Greenwood	5,836
Bradford	14,454	Gulfport	6,386
Carbondale	17,040	Hattiesburg	11,738
Chester	38,537	Jackson	21,262
Coatesville	11,084	Laurel	8,465
Connellsville	12,845	Meridian	23,285
Corry	5,991	Vicksburg	20,814
Dubois	12,623	<b>LOUISIANA—11</b>	
Easton	28,532	Alexandria	11,213
Erie	66,525	Baton Rouge	14,897
Franklin	9,767	Donaldsville	4,090
Harrisburg	64,186	Hammond	2,942
Hazleton	25,452	Jennings	3,925
Johnstown	55,482	Lafayette	6,392
Lebanon	19,240	Lake Charles	11,449
Lock Haven	7,772	Natchitoches	2,532
McKeesport	42,604	New Iberia	7,499
Meadville	12,780	New Orleans	339,075
New Castle	36,280	Shreveport	28,015
Oil City	15,657	<b>TENNESSEE—14</b>	
Pittston	16,267	Bristol	7,148
Pottsville	20,236	Chatanooga	44,604
Reading	96,071	Clarksville	8,548
South Bethlehem	19,973	Etowah	1,685
Titusville	8,533	Jackson	15,779
Wilkes-Barre	67,105	Knoxville	36,346
Williamsport	31,860	La Follette	2,816
York	44,750		

Name of Place	Population	Name of Place	Population	Name of Place	Population	Name of Place	Population
Lawrenceburg	1,687	Salem	2,669	Hillsboro	1,877	Sweetwater	4,176
Lebanon	3,659	Springfield	51,617	Moundon	3,873	Taylor	5,814
Memphis	131,105	Spring Valley	7,035	Marmouth	790	Terrell	7,050
Murfreesboro	4,679	Sterling	7,467	Minot	6,188	Waco	26,425
Nashville	110,864	Waukegon	16,069	Williston	3,124	Willis	4,657
St. Elmo	2,426	WISCONSIN—13		SOUTH DAKOTA—15		Yoakum	4,657
Springfield	2,085	Antigo	7,196	Aberdeen	10,758	COLORADO—8	
KENTUCKY—11		Appleton	16,773	Belle Fourche	1,852	Colorado City	4,333
Covington	53,270	Ashland	11,594	Canton	2,103	Colorado Springs	29,178
Cynthiana	3,603	Eau Claire	18,310	Chamberlain	1,275	Denver *	231,881
Harrodsburg	3,147	Fond-du-Lac	18,797	Dell Rapids	1,367	Durango	4,686
Hopkinsville	9,419	Green Bay	25,236	Huron	5,791	Ft. Collins	8,210
Kinsville	2,322	Jonesville	18,894	Lead	8,392	Grand Junction	7,754
Lexington	34,099	Ladysmith	2,352	Madison	3,187	Montrose	3,254
Middlesboro	7,805	Menominee	5,036	Pierre	8,656	Pueblo	44,395
Newport	30,309	Oshkosh	38,062	Rapid City	3,854	NEW MEXICO—2	
Mt. Sterling	3,932	Portage	5,440	Sioux Falls	14,094	Las Vegas	3,719
Paducah	22,760	Rice Lake	3,968	Springfield	675	Roswell	6,172
Pineville	2,161	Superior	40,384	Vermillion	2,187	OKLAHOMA—23	
OHIO—8		IOWA—10		Watertown	7,010	Ada	4,309
Ashtabula	18,266	Burlington	34,234	Yankton	3,787	Ardmore	8,618
Dayton	116,577	Cedar Rapids	33,811	MONTANA—4		Bartlesville	6,187
Jackson	5,468	Des Moines	86,368	Butte	39,165	Collinsville	1,324
Lakewood	15,181	East Aurora	15,548	Helena	12,515	Duncan	2,477
Middletown	13,152	Fort Dodge	15,448	Missoula	12,869	El Reno	7,872
Norwood	16,185	Keokuk	14,008	Polson	1,289	Enid	13,799
Sandusky	19,989	Marshalltown	13,374	WYOMING—2		Holdenville	11,654
Springfield	46,921	Mason City	11,230	Cheyenne	11,820	Guthrie	2,296
MICHIGAN—22		Ottumwa	22,012	Sheridan	8,408	Lawton	7,788
Adrian	10,763	Sioux City	47,826	IDAHO—2		MacAlester	12,954
Ann Arbor	14,817	MINNESOTA—9		Boise	17,358	Miami	2,907
Battle Creek	25,267	Duluth	78,466	Lewiston	6,043	Mukogee	25,278
Beaumer	4,583	Eveleth	7,036	MISSOURI—6		Oklahoma City	64,205
Big Rapids	4,519	Faribault	19,001	Aurora	4,148	Okmulgee	4,178
Cadillac	8,375	Mankato	10,365	Joplin	32,073	Pawhuska	2,474
East Jordan	2,516	Morris	2,100	Kirksville	6,347	Purcell	2,740
Easton Rapids	2,094	St. Cloud	10,600	Monette	4,177	Sapulpa	8,283
Fremont	2,009	St. Paul	214,744	Springfield	35,201	Stillwater	8,444
Grand Rapids	112,571	Tower	1,111	West Plains	2,914	Tulsa	18,182
Harbor Beach	1,556	Two Harbors	4,990	ARKANSAS—2		Wagoner	4,018
Jackson	31,438	KANSAS—42		Fort Smith	23,975	Weatherford	2,118
Manistee	12,381	Abilene	4,118	Mena	3,953	Wewoka	1,022
Marquette	11,503	Anthony	2,669	TEXAS—53		WASHINGTON—9	
Monroe	6,893	Arkansas City	7,508	Abilene	9,204	Centralia	7,311
Nunising	2,952	Caldwell	2,205	Amarillo	9,957	Chebolic	4,507
Owosso	9,639	Chanute	9,272	Aransas Pass	1,197	Everett	24,814
Portiac	14,532	Cherryvale	4,304	Austin	29,860	Hoquiam	8,171
Port Huron	18,863	Coffeyville	12,687	Barry	1,197	North Yakima	14,082
Saginaw	50,870	Council Grove	2,545	Beaumont	20,640	Olathe	3,000
Traverse City	12,115	Dodge City	3,214	Bishop	2,640	Spokane	104,402
Wyandotte	8,287	Emporia	9,058	Brownsville	10,517	Tacoma	83,743
ILLINOIS—46		Eureka	2,333	Calvert	2,579	Walla Walla	19,364
Bloomington	25,768	Fort Scott	10,463	Cleburne	10,864	OREGON—4	
Braceville	1,314	Fredonia	3,500	Coleman	3,046	Baker City	6,680
Cairo	14,548	Garden City	3,171	Corpus Christi	8,222	Florence	311
Carbondale	5,411	Garnett	2,334	Dallas	92,104	La Grande	4,843
Centralia	9,680	Girard	2,446	Denison	15,632	Portland	207,714
Chenoa	1,314	Great Bend	4,622	Denton	4,732	CALIFORNIA—21	
Chrisman	1,193	Hiawatha	2,974	Elkhart	1,896	Alhambra	5,021
Clinton	5,165	Holton	2,842	El Paso	89,279	Bakersfield	12,727
Coal City	2,667	Hutchinson	16,364	Ft. Worth	73,802	Berkeley	40,431
Decatur	31,140	Independence	10,480	Franklin	1,390	Long Beach	17,089
Dixon	7,216	Iola	9,032	Frankston	1,390	Modesto	7,258
East Peoria	1,493	Junction City	5,598	Galveston	36,981	Monterey	4,923
Efingham	3,898	Kansas City	82,331	Greenville	8,850	Napa	5,791
Elgin	25,976	Kingman	2,570	Harlingen *	2,800	Oakland	150,174
Flora	2,704	Lawrence	12,374	Honey Grove	2,800	Pasadena	30,291
Forest Park	6,594	Leavenworth	19,363	Houston	78,800	Pomona	10,207
Geneseo	3,199	McPherson	8,546	Kennedy	1,147	Riverside	15,212
Hamilton	1,627	Manhattan	5,722	Luling	1,404	Sacramento	44,696
Harrisburg	5,309	Marion	1,841	Lyford	3,272	San Bernardino	12,779
Harvey	7,227	McPherson	8,546	McAllen	1,896	San Diego	39,578
Highland Park	4,209	Manhattan	5,722	McKinney	7,000	San Jose	28,946
Hillsboro	3,424	Newton	7,682	Marble Falls	1,061	San Luis Obispo	5,157
Jacksonville	15,326	Olathe	3,272	Marshall	11,452	San Mateo	4,384
Joliet	34,670	Oswatimie	4,046	Nixon	5,527	Santa Cruz	11,146
Kewanee	9,307	Ottawa	7,650	Orange	5,527	Santa Monica	7,847
Lincoln	10,892	Parsons	12,463	Palestine	10,482	Stockton	23,253
Marseilles	3,291	Pittsburg	14,755	Polson	1,699	Vallejo	11,340
Moline	24,199	Pratt	3,302	Port Arthur	7,668	ARIZONA—2	
Mount Carmel	6,934	Sabetha	43,684	Port Lavaca	1,699	Douglas	6,437
Murphysboro	7,485	Topeka	43,684	Robston	1,699	Roby	11,134
Newton	2,108	Wellington	7,034	San Antonio	96,614	UTAH—5	
Olney	5,011	Wichita	52,450	San Benito	1,699	Logan	7,522
Oregon	2,180	NEBRASKA—5		Sherman	14,412	Murray	4,057
Ottawa	5,535	Beatrice	9,356	Sinton	1,500	Ogden	25,580
Paris	7,664	Kearney	6,202	Somerville	1,500	Spier	8,925
Pekin	9,897	Lincoln	43,973	Spur	1,500	Salt Lake City	92,777
Port Byron	1,699	Nebraska City	5,488	NORTH DAKOTA—8			
Princeton	4,131	Omaha	124,069	Bismarck	5,443		
River Forest	2,732	NORTH DAKOTA—8		Devil's Lake	5,157		
Rochelle	45,401	Bismarck	5,443	Fargo	14,331		
Rockford	45,401	Devil's Lake	5,157				
Rock Island	24,335	Fargo	14,331				

\* Abandoned.

\* Abandoned.

PLACES REPORTED AS HAVING CITY MANAGERS

Compiled to Nov. 1, 1916, by C. O. Dustin, Secretary  
Bureau of Municipal Research, Springfield, Mass.,  
with Additions from Earlier Year Book Lists.

Name of Place	Population 1910 Census	Date in Effect	Salary
Norwood, Mass.	8,014	Jan. 1915	\$8,000
Newburgh, N. Y.*	27,805	Jan. 1916	5,000
Sherrill, N. Y.	.....	May 1916	125
Niagara Falls, N. Y.*	80,445	Jan. 1916	5,000
Watertown, N. Y.*	26,780	Jan. 1918	.....
Highland Park, N. J.	1,517	June 1916	1,000
West Orange, N. J.	10,980	July 1916	2,200
Grove City, Pa.	3,674	Apr. 1916	1,500
Titusville, Pa.	8,583	Dec. 1913	.....
Charlottesville, Va.	6,765	Aug. 1913	600
Fredericksburg, Va.	5,874	Sept. 1912	3,000
Graham, Va.	1,917	May 1916	1,500
Luray, Va.	1,218	.....	.....
Portsmouth, Va.*	33,190	Sept. 1916	.....
Staunton, Va.	10,604	Jan. 1908	1,800
Winchester, Va.	5,864	May 1916	2,000
Charleston, W. Va.	22,996	May 1915	3,800
Wheeling, W. Va.*	41,641	July 1917	.....
Williamson, W. Va.	3,561	Jan. 1916	1,800
Durham, N. C.	18,241	.....	.....
Elizabeth City, N. C.*	8,412	Apr. 1915	1,800
Hickory, N. C.*	3,716	May 1913	1,500
High Point, N. C.	9,525	May 1915	2,500
Morgantown, N. C.*	2,712	May 1918	900
Tarboro, N. C.	4,129	Apr. 1915	1,500
Thomasville, N. C.	3,877	May 1915	1,200
Beaufort, S. C.*	2,486	Apr. 1915	2,400
Rock Hill, S. C.	7,216	Jan. 1915	2,500
Sumter, S. C.*	8,109	Jan. 1913	3,600
Lakeland, Fla.*	3,719	May 1914	2,100
Largo, Fla.	291	June 1913	900
St. Augustine, Fla.*	5,494	July 1915	3,600
St. Petersburg, Fla.	4,127	July 1916	.....
Cynthiana, Ky.	3,603	Dec. 1915	900
Johnson City, Tenn.	8,502	July 1909	1,800
Ashtabula, Ohio*	18,266	Jan. 1916	2,500
Dayton, Ohio*	116,577	Jan. 1914	12,500
East Cleveland, Ohio*	9,179	Jan. 1918	.....
Kenmore, Ohio	1,561	.....	.....
Sandusky, Ohio	19,989	Jan. 1916	3,600
Springfield, Ohio*	46,921	Jan. 1914	6,000
Tiffin, Ohio	11,894	Apr. 1917	.....
Westerville, Ohio*	1,908	Jan. 1916	1,500
Zanesville, Ohio	28,026	Jan. 1918	.....
Albion, Mich.	5,833	Jan. 1916	3,000
Alpena, Mich.*	12,706	Apr. 1916	2,500
Benton Harbor, Mich.	5,185	.....	.....
Big Rapids, Mich.*	4,518	May 1914	1,200
Cadillac, Mich.*	8,375	Mar. 1914	1,600
Grand Haven, Mich.	5,856	Apr. 1915	1,800
Grand Rapids, Mich.*	112,671	Mar. 1917	.....
Jackson, Mich.*	81,438	Jan. 1915	6,000
Manistee, Mich.	12,381	May 1914	2,000
Petoskey, Mich.*	4,778	Apr. 1916	2,000
Glencoe, Ill.	1,899	Jan. 1914	2,500
River Forest, Ill.	2,456	.....	.....
Winnetka, Ill.	3,168	Jan. 1915	3,000
Horicon, Wis.	1,981	Apr. 1914	1,000
Bloomfield, Iowa	2,028	July 1912	680
Chariton, Iowa	3,794	.....	.....
Clarinda, Iowa	3,882	Apr. 1913	1,700
Grinnell, Iowa	5,036	Sept. 1916	2,400
Iowa Falls, Iowa	2,797	Apr. 1914	1,500
Webster City, Iowa*	5,208	Oct. 1915	1,800
Morris, Minn.	2,100	Jan. 1914	1,700
Abilene, Kan.	4,118	June 1913	1,200
Mulberry, Kan.	997	Oct. 1914	1,000
Clark, S. D.	1,220	May 1912	960
Glasgow, Mont.	1,158	July 1916	1,200
Bentonville, Ark.	1,956	Sept. 1915	1,500
Amarillo, Texas*	9,957	Dec. 1913	3,000
Brownsville, Texas*	10,517	Jan. 1916	3,000
Denton, Texas*	4,782	Apr. 1914	2,000
San Angelo, Texas*	10,321	Apr. 1916	2,500
Sherman, Texas*	12,412	Apr. 1915	2,400
Taylor, Texas*	5,814	Apr. 1914	2,600
Teague, Texas	3,288	Jan. 1915	1,680
Terrell, Texas	7,050	.....	.....
Tyler, Texas*	10,400	Apr. 1915	3,000
Yoakum, Texas*	4,657	.....	.....
Durango, Cal.	4,686	Mar. 1915	1,800
Montrose, Col.	3,252	Feb. 1914	1,800
Roswell, N. Mex.	6,172	May 1914	1,800
Collinsville, Okla.*	1,324	Feb. 1914	1,500
Norman, Okla.	3,724	.....	.....
Snohomish, Wash.	3,244	.....	.....
La Grande, Ore.*	3,843	Oct. 1913	2,400
Alhambra, Cal.	5,021	July 1915	2,400
Bakersfield, Cal.*	12,727	Apr. 1915	3,000
Glendale, Cal.	2,746	May 1914	1,800

Name of Place	Population 1910 Census	Date in Effect	Salary
Holtville, Cal.	729	.....	.....
Huntington Beach, Cal.	815	July 1916	\$2,400
Englewood, Cal.	1,538	.....	.....
San Diego, Cal.	89,578	May 1915	6,000
San José, Cal.*	28,946	July 1916	6,000
San Rafael, Cal.	5,934	Aug. 1915	2,400
Santa Barbara, Cal.*	11,657	Oct. 1917	.....
Phoenix, Ariz.*	11,134	Apr. 1914	5,000
Tempe, Ariz.	1,473	.....	.....
Tucson, Ariz.	13,193	Jan. 1915	4,000

\* Commission-Manager Cities, according to classification of the Short Ballot Association, New York City.

**MUNICIPAL LEAGUE, NATIONAL.** The league was organized in 1894 for the study of municipal problems. On Dec. 15, 1916, its membership was 2638. The 22nd annual meeting was held at Springfield, Mass., November 23rd-25th, in conjunction with the City Managers' Association, the Massachusetts Civic League, the Training School for Public Service, and other organizations. A municipal research conference resulted in the formation of a separate organization to meet annually in conjunction with the league.

Among the important reports were those dealing with municipal courts (Harry Olson), sources of revenue (Robert M. Haig), franchises (Delos F. Wilcox), and the relation of the city to food supply (Clyde L. King). "Political Parties in City Government" was discussed by Charles A. Beard, A. R. Hatton, Richard S. Childs, Albert Bushnell Hart, and others. Among the speakers on "City Planning" were J. Horace McFarland, Nelson P. Lewis, Robert H. Whitten, and George B. Ford. The extension of municipal activities and municipal expenditures was discussed by Mrs. V. G. Simkhovitch, Allen T. Burns, and A. R. Hatton. Lawson Purdy, president of the league, spoke on "Some Advance Municipal Steps"; Clinton Rogers Woodruff, secretary, on "Municipal Preparedness."

Lawson Purdy was reelected president; Clinton Rogers Woodruff, secretary; and George Burnham, Jr., treasurer. Most of the vice-presidents, from different parts of the country, were also reelected. M. N. Baker was chosen chairman of the executive committee.

Prizes were awarded as follows: the Baldwin Prize, for the best essay on efficient billboard regulation, to Bernice V. Brown of Radcliffe College; the high school prizes, for the best essays on keeping highways clean, to Carroll Stansbury, Washington, D. C., and Virginia Crutcher, Pine Bluff, Ark.; the Portland Prize, for an essay on the unearned increment tax as a source of revenue for Portland, Ore., to Miss Clara Eliot of Reed College; the Hull Prize to Edward C. Mable of Dartmouth College, for his essay, "A Study of Municipal Accounting and Indebtedness in New Hampshire."

During the year two volumes were published in the National Municipal League series, *City Planning*, by John Nolen, and *Satellite Cities*, by Graham Romeyn Taylor. Three others were in course of preparation.

The league's official organ continued under the same general editorship, with Dr. C. C. Williamson of New York succeeding Dr. John A. Fairlie, and Miss Alice M. Holden of Vassar College succeeding Miss Adelaide R. Hasse, as associate editors.

**MUNICIPAL OWNERSHIP.** No marked

changes in the general status of municipal ownership occurred during the year 1916. New figures for the ownership of Canadian water-works are shown by the accompanying table. About 75 per cent of the works of the whole Dominion were municipally owned; 95 per cent in New Brunswick and 100 per cent in Manitoba and Saskatchewan. Quebec and British Columbia showed a heavy percentage of private ownership; but even in those provinces the percentages are under 50.

## OWNERSHIP OF CANADIAN WATER-WORKS

(From Water-Works and Sewerage Systems of Canada, 1916; Compiled by the Commission of Conservation of Canada.)

Provinces	Number of Works		
	Municipal	Private	Total
Novia Scotia . . . . .	80	3	83
Prince Edward Island . . . . .	2	1	3
New Brunswick . . . . .	18	2	20
Quebec . . . . .	102	75	177
Ontario . . . . .	148	18	166
Manitoba . . . . .	18	..	18
Saskatchewan . . . . .	80	..	80
Alberta . . . . .	24	9	33
British Columbia . . . . .	29	24	53
Total . . . . .	396	132	528

**MUNITION FACTORIES.** See UNITED STATES AND THE WAR.

**MUNEO, ROBERT.** See GREAT BRITAIN, Government.

**MÜNSTERBERG, HUGO.** A German-American psychologist and author, died at Cambridge, Mass., Dec. 16, 1916. He was born at Danzig, Germany, June 1, 1863, graduated from Leipzig (Ph.D.) in 1885, from Heidelberg (M.D.) in 1887, and taught psychology at Freiburg in 1887-92. In the latter year he came to America and was appointed professor of psychology and director of the psychological laboratories at Harvard University, a position which he retained until his death. In 1910-11 he was Harvard exchange professor at the University of Berlin. Münsterberg was president of the American Psychological Association in 1898, vice-president of the International Congress of Arts and Sciences (St. Louis, 1904) and of the International Philosophical Congress (Heidelberg, 1908). He organized and was the first director of the America-Institut of the German government (1910-11), and was elected a fellow of the American Academy of Arts and Sciences. The first part of his professorial career was given chiefly to physiological psychology, but later he devoted himself to the psychological problems of everyday life and to questions of idealistic philosophy. His books dealing with the psychology of testimony, medicine, education, etc., were written in popular style and are of great service in correcting many prevalent misconceptions concerning those topics. More particularly his late writings on the psychological conditions of efficiency, especially the limitations of the human factor in industrial employment, attracted much attention to that subject. After 1903 he edited the Harvard Psychological Studies. In addition to his psychological work, Münsterberg sought to be an interpreter of American life and institutions to Germany and was also diligent in promoting the interests of his native country, especially after the outbreak of the European war in August, 1914. He was an outspoken defender of the German cause, and during the first

year of the war resigned his position at Harvard after the publication of an offer from Major Wiener in London, a former Harvard student, to bequeath \$10,000,000 to that institution if it would dismiss the professor. He was induced to recall his resignation, but the strong pro-Ally sentiment in his Harvard environment made his situation difficult, especially by reason of the estrangement of former colleagues with whom he had been closely associated. He fell dead when addressing a class. He wrote a large number of books, including: *Psychology and Life* (1902); *American Traits* (1902); *The Americans* (1904); *Eternal Life* (1905); *Science and Idealism* (1906); *On the Witness Stand* (1907); *Psychology and the Teacher* (1909); *Psychology and Industrial Efficiency* (1912); *Grundzüge der Psychotechnik* (1914); *Psychology and Social Sanity* (1914); *The War and America* (1914); *The Peace and America* (1915); and *To-morrow: Letters to a Friend* (1916).

**MURPHY, JOHN BENJAMIN.** An American surgeon, died Aug. 11, 1916, at Mackinac Island, Mich. He was born at Appleton, Wis., in 1857. His professional training was obtained at Rush Medical College, Chicago, from which he graduated in 1879, and at the universities of Vienna, Munich, Berlin, and Heidelberg during the years 1882-84. Entering practice in Chicago, he early became recognized for his achievements in surgery. He was appointed a lecturer at Rush Medical College, professor in the Post-Graduate Medical School (1890), in the College of Physicians and Surgeons (1892), and in the Northwestern University Medical School (1895). At Mercy Hospital, Chicago, where he was chief of the surgical staff, Dr. Murphy performed many of his operations, but he was identified with several other hospitals. His clinics were of the highest interest to other surgeons. He gained fame for his work as a bone "carpenter," for grafting cartilage, for an operation in which he manufactured a new jaw from metal and silver wire, for his nitrogen treatment of tuberculosis, and for his work in intestinal surgery. To fasten the ends of the intestines after a piece had been removed, he devised a metal ball known as Murphy's button, the success of which electrified the surgical world. Among many honors which came to him were: the Laetare medal, awarded to distinguished American Catholic laymen by the University of Notre Dame; honorary degrees from the University of Illinois and the University of Sheffield, England, the presidency of the American Medical Association (1911), membership in foreign societies, and the collar and cross of St. Gregory the Great, conferred at the direction of Pope Benedict XV. When Colonel Roosevelt was shot in Milwaukee in 1912, Dr. Murphy was called on to treat the wound. Some months before his death the surgeon had been a guest at a banquet to Archbishop Mundelein of Chicago, and had partaken of soup that proved to have been poisoned. He had not been well since, but his death was ascribed to heart disease.

**MUSEUMS.** See ARCHITECTURE.

**MUSIC.** GENERAL NEWS. The third year of the war saw an improvement of musical conditions, especially in France and Russia. Nevertheless, the number of foreign artists visiting the United States was still far above normal. In New York, the national centre of musical activity, the average number of important con-

certs was about 40 per week at the height of the season. The New Orleans Opera House, which had been badly damaged by the great flood and storm of the preceding year, was sold at public auction. It was bought and renovated by an unknown benefactor, and then presented to Tulane University; at the same time several public-spirited citizens raised a fund of \$1,000,000, to be administered by the university, for the maintenance of the opera house as a municipal institution. In the observance of the Shakespeare tercentenary celebration, music, naturally, played a very prominent part, and perhaps the most elaborate production in this connection was Percy MacKaye's gorgeous pageant, *Caliban by the Yellow Sands*, with music by Arthur Farwell, mounted in the Stadium of the College of the City of New York. Musical pageants, in fact, have come so much into popular favor within the last five years, that Yale University chose that form for the bicentenary celebration of its foundation in October. Not less than 7800 persons took part in this pageant, which was under the general direction of Francis H. Markoe ('06); all the music was specially written by members of the Yale faculty, William E. Haesche, David S. Smith, Horatio Parker, and Harry B. Jepson. In spite of the war neither England nor Germany neglected to observe the Shakespeare tercentenary with due solemnity. In England this occasion brought to light an enormous mass of incidental music written to almost every play of the great poet. The activity of German scholars unearthed from the dust of libraries an unknown violin-concerto in B $\flat$  of Haydn and a forgotten aria from Gluck's *Demetrio* (1742).

#### THE UNITED STATES

**ARTISTS. Instrumentalists.** The fact that many of the world's foremost pianists were concertizing in the United States did not deter many new artists from making their American debut, and a considerable number of these new aspirants for public favor met with striking success. Guiomar Novaes, a young Brazilian pianist scarcely out of her teens, took her audiences by storm through dashing brilliancy, variety of tonal color, sound musicianship, and astonishing maturity of conception. Albert Lortat, a Frenchman, exhibited not only the limpid technic, grace, and easy elegance characteristic of the modern French pianists, but aroused admiration by the boldness and grandeur of his conception, as well as the masterly and sympathetic interpretation of works of widely different styles; his recitals with J. Thibaud left no room for doubt as to his eminence as an ensemble-player. Enrique Granados, who had come primarily for the purpose of witnessing the world-première of his opera *Goyescas* at the Metropolitan Opera House, appeared in a few recitals, chiefly as an interpreter of his own works, and charmed through elegance and refinement; he evidently had a predilection for works of the modern impressionists. Mischa Levitzki, who had not yet reached his twentieth year, exhibited a poise and restraint very unusual in so young an artist; the maturity of his conception gave the impression that with him the intellect dominates everything, and that spontaneous impulse is a factor almost completely eliminated. Dorothy Berliner proved

herself a player of exquisite refinement and eminently poetic temperament. Carlos de Castillo, a Mexican, introduced himself as a formidable Liszt player of great brilliancy. Besides these newcomers there were a few pianists who had been heard before, but whose performances during the past year rose to an artistic level higher than had been attained before. Beryl Rubinstein, who ten years ago toured the country as a child-prodigy, returned from his European studies as a player of prodigious technic, which is rather too much in evidence as a quality exhibited for its own sake. Th. Henrion, a Belgian, who made a favorable impression the year before, showed that his tone had gained in beauty and variety of color. Before her appearances of the past year Margaret Volavay had been heard only with orchestra and in works of the extreme impressionists, so that it was impossible to arrive at a definite estimate of her real ability; her recent recitals revealed her as an artist of superb attainments. After an absence of nine years Richard Buhlig reappeared as a matured artist; he was most satisfactory in large works permitting the building of powerful climaxes; his touch is rather heavy for works calling for the subtler qualities. The sisters Rose and Otilie Sutro were heard with genuine pleasure in their joint recitals on two pianos, which form of concert-giving they have brought to such perfection that it is impossible to distinguish the individual performer; the effect produced is that of a single artist commanding a tone of extraordinary fullness. In respect to ensemble they surpassed even those two giants, Bauer and Gabrilowitsch, who also were heard in joint recitals; but each of whom preserved his individual style and touch. Leo Ornstein continued to play his own and other futuristic music, and seems to have found audiences that take him seriously; only in Chicago was he greeted with laughter. The playing of Teresa Carreño, who had not been heard for three years, caused a mild sensation. All the old-time fire, brilliancy, and virility were still there unimpaired; she still was the peerless "Valkyrie of the piano," holding her listeners under her magic spell; but there was also something new and undefinable, yet distinctly felt; some critics thought they discovered moments of unwonted tenderness, others spoke as though her art had become capable of subtler nuances, of greater variety and finer differentiation of tonal effects. Be that as it may, on one point all agreed: that the great artist was at the zenith of her powers. Of the other great pianists, most of whom have for years been recognized favorites, nothing new can be said; all were greeted by large and enthusiastic audiences. The list comprises the names of Ignace Paderewski, Josef Hofmann, Arthur Friedheim, Harold Bauer, Ossip Gabrilowitsch, Carl Friedberg, Rudolf Ganz, Ernest Schelling, Leopold Godowsky, Herbert Fryer, Harold Henry, Percy Grainger, Ethel Leginska, Germaine Schnitzer, Katharine Goodson, Yolanda Merö, Olga Samaroff, Fannie Bloomfield-Zeisler, Marguerite Melville-Lisznewska.

Among the violinists, the deepest impression was made by the young English artist, Isolde Menges. For her début she had chosen the Brahms concerto, a rather unfortunate choice, since she was not yet equal to the demands of this work, which taxes the powers of the greatest

interpreters. But in her subsequent concerts she proved herself an artist of fiery temperament, great personal magnetism, and facile technic. She draws a large and beautiful tone. Eddy Brown, a young American, was received with marked favor; he proved himself an artist of temperament and refinement. If Carreño surprised her admirers, Jacques Thibaud dumfounded all who had heard him before. He had securely established his reputation as a sterling artist, but no case comes to mind where such extraordinary development has taken place in so short a time. In December, 1914, his American tour was cut short by the death of his father, and after that he served a year in the army. The experiences through which he passed in that time must have made an indelible impression upon his mind and affected his whole conception of art. On his reappearance he revealed a breadth of conception and an emotional intensity of which his previous performances had given no intimation; from a player of charming elegance and refinement he has suddenly grown into one of colossal power. Theodore Spiering, formerly concert-master of the New York Philharmonic Society, and during the illness of Mahler its conductor, is not entirely unknown as a soloist, but the recitals that he gave during the past year disclosed such admirable qualities as a violinist and such solid musicianship, that it is a pity he is not heard more frequently. Other artists heard were Fritz Kreisler, Albert Spalding, Efreim Zimbalist, Mischa Elman, Anton Witek, Arthur Hartmann, Maximilian Pilzer, Kathleen Parlow, Maud Powell, Mary Zentay, Vera Barstow, Florence Austin.

A new Dutch violoncellist, Michael Penha, met with favor; he has a large tone and fine technic. Herman Sandby, formerly first 'cello of the Philadelphia Symphony Orchestra, resigned to devote himself entirely to the concert-stage; he was heard in numerous recitals and also in his own concerto, with orchestra. Other prominent violoncellists were Pablo Casals, Boris Hambourg, Paulo Gruppe, Alwin Schröder, Leo Schulz, Cornelius van Vliet. Quite unique were the recitals of the Spanish guitar-virtuoso, Miguel Llobet, who won much success with his splendid rendition of music written for his instrument.

*Vocalists.* Of the famous operatic singers, Frieda Hempel and Maude Fay appeared for the first time as Lieder singers; the former proved that she is equally mistress of the dramatic and lyric art, while the latter gave evidence of even greater powers on the concert stage than in opera. A most favorable impression was also made by Sophie Braslau, the young contralto of the Metropolitan Opera House, who won applause not only by her fine singing, but also by her versatility. Nina Dimitriev, in costume, gave recitals of Russian songs, preceded by a short talk explanatory of the characteristics of Russian folk-music, while Charlotte Lund devoted herself to the interpretation of Scandinavian songs. Craig Campbell, a Scotch tenor, scored a genuine success with his masterly rendition of German and French songs. Considerable interest was shown in the reappearance after many years of Susan Metcalf, now Mme. Pablo Casals; she was assisted at the piano by her husband, who proved himself a remarkably fine pianist. Something quite out

of the ordinary were the recitals of Ratan Devi, an Englishwoman married to a Hindoo, Dr. Ananda Coomaraswamy, who interpreted Hindoo rāgas and folk-songs. The doctor first explained the Hindoo musical system, after which his wife, in Hindoo costume and squat on a rug, sang the songs to her own accompaniment on the tamboura (a kind of lute with a very long neck). After an absence of several years Mme. Marcella Sembrich charmed her hearers as of old; her voice still maintains its beautiful quality, and as a queen of song she is still unsurpassed. The other artists that added lustre to a brilliant season were Julia Culp, Elena Gerhardt, Mme. Schumann-Heink, Margarete Matzenauer, Marcella Craft, Alma Gluck, Mariska Aldrich, Anne Arkadij, Marie Kuznietsov, Louise Homer, Tilly Koenen, Olive Fremstad, Jeannette Dufau, Clara Clemens Gabilowitsch, Frances Alda, Frances Ingram, Julia Claussen, Yvette Guilbert, John McCormack, Reinald Werrenrath, Louis Graveure, Arthur Middleton, Emilio de Gogorza, Evan Williams.

*ORCHESTRAS.* Largely through the efforts of Mayor James H. Preston, the Baltimore Symphony Orchestra, partly (\$6000) subsidized by the municipality, was established, and began its first season most auspiciously under Gustav Strube as conductor and J. C. van Huleteyn as concert master. To her first gift of \$100,000 for the pension fund of the Chicago Symphony Orchestra, Mrs. Elizabeth Sprague Coolidge added an equal amount with the request that the fund thus created be known as the "Albert and Nancy Sprague Memorial Fund" (in memory of her parents). Mrs. Coolidge's example was followed by other bequests for the same purpose, so that by the end of the year the fund had grown to \$237,500. An unnamed benefactor offered to pay in full any deficit of the Philadelphia Symphony Orchestra for the next five years, provided that within that time a guarantee fund of \$500,000 shall have been established, and that Leopold Stokowski be retained as conductor. The first season of the San Francisco Symphony Orchestra under its new conductor, Alfred Hertz, was very successful artistically; but before the end of the season dissension, which for a time threatened to disrupt the orchestra, broke out among the members of the association. The disaffected members organized the "People's Philharmonic Orchestra" under Nikolai Sokolov, and began with a series of popular concerts in July, the intention being to give regular symphony concerts during the winter. In the meantime the directors of the older organization had raised a guarantee fund and engaged new players in place of the deserters. Thus reorganized and strengthened, the orchestra began its second season under Hertz in October. The rival orchestra then changed its plans, and continued to devote itself, under a new leader, Max Bendix, to popular concerts. The New York Philharmonic Society (Josef Stransky) had planned a Strauss Festival in connection with the American première of the new Alpine Symphony, but owing to the non-arrival of the orchestral parts was compelled to change its plans. The festival, however, did take place on January 13th and 14th, when *Tod und Verklärung*, *Heldenleben*, and the finale from *Salome* were produced. This programme offered an excellent comparison of the composer's earlier and later style. At the end of the season the Philharmonic Soci-

ety and Oratorio Society (Louis Koemmenich) joined forces in a Bach-Beethoven Festival, producing the *Magnificat* and *Ninth Symphony*. Once more the Russian Symphony Orchestra experimented with the "clavier de lumière" (colored light keyboard) in the performance of Liadov's *Enchanted Lake*, but with no more convincing results than had attended the performance of Skriabin's *Prometheus* the year before. At one of its concerts the Minneapolis Symphony Orchestra gave Beethoven's *Triple Concerto* with the concert master Czerwonky (vl.), the first 'cellist van Vliet (vcl.), and the conductor at the piano—the first time in 14 years that Mr. Oberhoffer had been heard as pianist. The New York Symphony Society (Walter Damrosch) produced Brahms's *Double Concerto* with Fritz Kreisler and Pablo Casals. The Boston Symphony Orchestra (Karl Muck) abandoned its policy of selling the subscription seats for the Boston concerts by auction, and adopted a fixed scale of prices. In New York the Civic Orchestra under Walter Rothwell gave a very successful series of high-class concerts during July and August at Madison Square Garden; a Wagner-night drew such numbers that many people were unable to gain admission.

NOVELTIES. The Boston Symphony Orchestra (Karl Muck) brought out on January 1st Ernest Schelling's *Impressions from an Artist's Life* (variations on an original theme), a thoroughly impressionistic work of great rhythmical variety. A *Concerto* for violin and orchestra by the same composer was played by Fritz Kreisler (October 20th); it is rather a symphony with violin obligato than a real concerto. The San Francisco Symphony Orchestra (Alfred Hertz) produced Dukas's *Le Péri* (January 7th), a dance-poem in the composer's familiar style. Genuine surprise was caused by Stravinsky's *Symphony* in E $\flat$  (January 15th) introduced by the Russian Symphony Orchestra (Modeste Altschuler). Instead of the expected futuristic cacophony the work showed the influence of Wagner and Tchaikovsky, but never rose above mediocrity. At a concert of the New York Philharmonic Society (Josef Stransky) Maximilian Pilzer played a *Concerto* for violin and orchestra in D minor by Edmund Severn (January 7th), which proved to be legitimate, effective music. The Philadelphia Symphony Orchestra (Leopold Stokowski) brought forward the first novelty on February 4th, a *Concerto* for violoncello and orchestra in D, by Herman Sandby, and played by the composer. It was decidedly ultra-modern, but contained some effective writing for the solo instrument. At the same concert was heard Camille Zeckwer's symphonic poem *Sohrab and Rustum*, a strange mixture of genuine music and futurism; it suffered from prolixity and frequent anticlimaxes. On March 2nd the American premiere of Mahler's *Eighth Symphony* in E $\flat$  took place with eight soloists, a mixed chorus of 800, a children's chorus of 150, and the orchestra increased to 110. Like all the other symphonies of this composer, this one also suffers from the lack of sustained inspiration; beautiful portions alternate with dreary stretches; nor do the musical ideas justify the employment of such an enormous technical apparatus. Nevertheless, the outward success, due chiefly to the fine performance, was so complete that the work was repeated three times in Philadelphia, and the

entire company brought to New York (Metropolitan Opera House, April 9th). The novelty offered by the Chicago Symphony Orchestra (Frederick Stock) was H. Kaun's *Third Symphony* in E minor (March 13th), a very fine work built skillfully on splendid material. The New York Symphony Society (Walter Damrosch) presented V. Kolar's *First Symphony* in D (January 28th), strong, virile music in the established classical form. Elgar's *Polonia* (March 4th), constructed on three Polish themes, is very well written, but scarcely inspired music. Henri Rabaud's *Symphony* in E minor (November 24th) is one of the finest of modern French works; it is built on Franck's principle of the "generative theme"; though very modern, it is free from extravagance. Two other works heard at the same concert, Elgar's *Sospiri* and Sinigaglia's *Etude-Caprice*, proved insignificant. The Denver Philharmonic Orchestra (Horace E. Turemann) contributed a symphonic poem, *The Fall of Nokomis* (March 7th), by R. Bourk; it was very impressionistic, highly colored, and utterly formless. At its concert of March 2nd the American Symphony Orchestra of Chicago (Glenn D. Gunn) offered Cecil Burleigh's *Violin-concerto*, a melodious, natural work, and C. W. Cadman's *Night Scene* and *Intermezzo from An Indian Idyl*, in which characteristic and effective use is made of aboriginal melodies. Perhaps the sensation of the year, certainly the work awaited with the keenest interest, was reserved for the Cincinnati Symphony Orchestra (Ernst Kunwald). When the New York Philharmonic Society was obliged to announce the postponement of Richard Strauss's *Alpensymphonie* because the parts had not arrived, Dr. Kunwald and Mr. Stokowski began a rivalry for the première. The work was first produced by Dr. Kunwald on April 25th; three days later Mr. Stokowski played it; while Mr. Stransky did not present it until October 26th. The Cincinnati orchestra was increased to 135 players, and the outward success was emphatic. The New York performance took place under normal conditions, and permitted a calmer estimate of the real merits of the composition. Its reception by the audience was rather chilling. The work contains passages of great beauty by the side of others that are commonplace and even brutal, and the most beautiful parts were reminiscent of Wagner and of Strauss's own earlier works.

CHAMBER MUSIC. The sudden death of Edward J. de Coppet (q.v.), founder and supporter of the famous Flonzaley Quartet, caused serious apprehension as to the future of an organization which by many is regarded as unequalled anywhere. But all anxiety was soon set at rest by Mr. de Coppet's son André, who announced his intention of continuing his father's policy. During the year the Flonzaleys brought out a new quartet in C by Tanéiev which was received with indifference in Boston, but with decided approval in New York. On the occasion of their visit to Chicago it happened for the first time in the history of that city that the hall was completely sold out for a chamber music concert. The Kneisel Quartet introduced an octet for strings by Enesco, which was not altogether satisfying because frequently the composer aimed at orchestral effects foreign to the combination of instruments for which he was writing; yet, on the whole, it contained very fine music.



With the assistance of Rudolf Ganz they produced a new piano-trio in A minor by Ravel of very advanced tendencies, which found most favor in Boston. From the Saslavsky Quartet was heard the violin-sonata and the unfinished piano-quartet in B $\flat$  by Lekeu, both interesting chiefly as tokens of great promise by a young composer suddenly taken away in his prime. Their rendition of a string-quartet in E by V. Kolar disclosed a work of real merit. Emil Schmidt (1st vl.), Louis Angeloty (2d vl.), Emil Hahl (vla.), and William Schmidt (vcl.), all members of the Philadelphia Symphony Orchestra, organized a new string-quartet which met with gratifying success during its first season. The Kortschak Quartet (Hugo Kortschak, Herman Felber, Jr., Clarence Evans, Emeran Stoeber), founded the preceding year in Chicago, received a substantial endowment from Mrs. Elizabeth Sprague Coolidge. In Boston the Russian Music Society was formed by Ethel Frank (sop.), N. Oulukanov (bar.), Emmanuel Ondricek (vl.), Carl Webster (vcl.), and Alfred de Voto (pf.); their object is the propagation of Russian chamber music. The novelty contributed by the Margulies Trio of New York was G. Schumann's Trio in F, a work in strict classical form, well written, but of little originality. Among the many artists that appeared in joint recitals special mention may be made of Bauer-Casals, Macmillen-Schnitzer, Parlow-Hutcheson, David and Clara Manne, Edouard and Gaston Dethier, Thibaud-Lortat, Tourret-Decreux. Two concerts given for charitable objects attracted wide attention. Paderewski, Schelling, Stojowski, Muratore, the Flonzaley Quartet, and the Trio de Lutèce gave their services for the benefit of the musicians of the Paris Conservatoire, raising \$10,000. To the children of the Spanish composer Granados, who with his wife was lost at sea in the *Sussex* disaster (March 24th), the sum of \$11,000 was turned over as the result of a benefit given by Barrantos, Culp, McCormack, Paderewski, Kreisler, and Casals, the last three appearing in the Beethoven trio in B $\flat$ , op. 97.

**CHORAL SOCIETIES.** In Chicago the American Choral Society was formed with James Pugh as president and Daniel Protheroe as conductor. Its avowed object is the production exclusively of choral works by American composers, but for some reason not readily apparent the concert on Easter Sunday was devoted to the *Messiah*. The Musical Art Society of Chicago, founded in 1906 by Clarence Dickinson, reappeared after two years of inactivity, completely reorganized, under the conductorship of Herbert E. Hyde. It consists of a chorus of 40 trained professional singers, and has for its object the production of a *cappella* music, ancient and modern. In fact, it works along the same lines as the New York society of the same name under Frank Damroch. Another body spreading the appreciation of a *cappella* music is the Æolian Choir of Brooklyn under N. L. Norden, established three years ago. Their specialty is the cultivation of the music used in the Russian liturgy, and besides a number of minor concerts they gave during Easter week in New York an excellent rendition of an ambitious programme of works from 4-9 parts. The New York Oratorio Society (Louis Koemmenich) gave Haydn's *Creation* for the first time in 21 years, and proved that this work still possesses tremendous

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vitality. In the first season under its new conductor, Chalmers Clifton, the Cecilia Society of Boston gave the American premiere of d'Indy's *Chant de la Cloche* (Lay of the Bell), a work that attracted the first attention to the composer in 1886. The Schola Cantorum (Kurt Schindler) was not happy in the choice of its novelties. Deems Taylor's *Chambered Nautilus* proved rather anemic, and Stojowski's *Prayer for Poland* was very bombastic and pretentious, but devoid of all inspiration.

**FESTIVALS.** The second Newark Festival under the direction of Mortimer C. Wiske took place in 1916 as part of an elaborate and unusually impressive celebration of the 250th anniversary of the foundation of the city. During the four days of festivities the two prize cantatas, Franz Bornschein's *Onowa* and Carl Busch's *America*, were produced, as well as W. F. Harlinge's *The Miracle of Time*. Henry K. Hadley had written the music for the gorgeous pageant, and on the last day the festival concluded with a performance of Berlioz' *Requiem* by a chorus of 3000 and an orchestra of 250. At the 22nd Cincinnati May Festival under Dr. Ernst Kunwald Mendelssohn's *St. Paul's*, Beethoven's *Missa Solemnis* and *Ninth Symphony*, Pierné's *Children's Crusade* and Strauss's *Alpensymphonie* were produced; the critics described the rendition of all works as "superlative." The first part of the 16th Syracuse Festival was made the occasion of a celebration of the Shakespeare tercentenary. At the 11th Bach Festival in Bethlehem under F. J. Wollé the *Christmas Oratorio* and the *Mass in B minor* were performed in a manner characterized by the critics as "the absolute perfection of choral singing." The principal work brought out at the Norfolk (Conn.) Festival was Brahms's *German Requiem*. Absolute novelties were C. M. Loeffler's symphony in one movement, *The Mystic Hour*, a very complex modern work, and Percy Grainger's suite *In a Nutshell*, a combination of queer rhythms and strange experiments in orchestration. The 59th annual Worcester Festival offered works of far less interest than is usually the case. At the 20th Maine Festival held in Bangor and Portland under the direction of William Chapman a festival hymn, *Twenty Years*, composed by the conductor for the occasion, was sung; another absolute novelty was Bainbridge Crist's *The Parting*, for baritone and orchestra. At this year's festival (the 14th) of the Bohemian Club in Bohemian Grove, Cal., N. J. Stewart's *Gold* was received with such favor that the principal numbers were repeated at a special concert given a week later in San Francisco. The enormous success of the first open-air production of *Siegfried* at the Harvard Stadium the preceding year led to a repetition of the same work by the same artists (the Metropolitan company under Bodanzky) in Pittsburgh, Cleveland, St. Louis, and Indianapolis. Chicago also had arranged for this production, but at the last moment canceled the engagement "owing to the unfavorable weather," as officially stated. The real reason was the virulent agitation against everything German on the part of certain influential leaders of society. In none of the cities mentioned did the attendance fall below 10,000. Open-air performances of *Die Walküre* by the same company were given with immense success in New Haven (Yale Bowl) and New York (Sta-

dium of the College of the City of New York). Philadelphia had an open-air performance of *Aida* by the Italian artists of the Metropolitan company under Polacco. But also oratorios were performed in this manner for the first time. Louis Koemmenich gave Verdi's *Requiem* with a chorus of 1200 and an orchestra of 120 in New York (Polo Grounds), and Walter Damrosch conducted the *Elijah* with a chorus of 1200 and an orchestra of 165 in Boston (Braves Field).

OPERA. At the Metropolitan Opera House of New York 132 performances were given from a repertory of 37 works by 22 composers. According to nationality these were divided as follows: Italian, 16 works by 9 composers totaled 55 performances; German, 15 works by 8 composers totaled 50 performances; French, 3 works by 2 composers totaled 13 performances; Russian, 2 works by 2 composers totaled 10 performances; Spanish, 1 work totaled 4 performances. Wagner, represented by 8 works, led with 28 performances. Next in order came Puccini, of whom 4 works achieved 18 performances. Verdi ranked third, with 16 performances of 5 works. The works most frequently given were Wagner's *Lohengrin*, Verdi's *Aida*, Bizet's *Carmen*, Puccini's *Bohème*, and Borodin's *Prince Igor*, each 6 times. Four novelties were produced as follows: *Goyescas* (January 28th) by Enrique Granados, with Fitziu, Martinnelli, and de Luca in the principal rôles, under the direction of Bavagnoli, though received kindly, made no deep impression. Its chief distinction is the fact that it is the first Spanish opera sung in Spanish in the United States. The libretto provides very little of real dramatic interest and affords no opportunities for musical climaxes, while the music itself is of the modern impressionistic type, all atmosphere without real substance, and rather monotonous. The most striking portions of the score are the national dances, yet these disclosed no new traits or special Spanish characteristics; such typical rhythms have long been made familiar to American audiences through the far more effective music of Bizet, Massenet, Moszkowski, etc.—*Les Pêcheurs des Perles* by Bizet was chosen for the opening of the season on November 13th, with Hempel, Caruso, de Luca, and Rother in the principal rôles, Polacco conducting. Although the first two acts were given at the Metropolitan Opera House on Jan. 11, 1896, this was the first performance in America in its entirety, and, therefore, the real première in this country. It was splendidly performed, but made no impression; in it the future composer of *Carmen* shows none of his real power. The libretto is ineffective, even dull; certain numbers are charmingly melodious, but on the whole the music is superficial and lacks vitality. Moreover, the influence of Gounod and Meyerbeer is too much in evidence.—Of great, but purely historical, interest was the American première of Gluck's *Iphigénie en Tauride* (November 25th), sung in German by Kurt, Rappold, Sembach, and Braun, under the direction of Bodanzky. Scenically and dramatically the performance was perfect, but it was evident that even those great singers were no more in sympathy with that sustained, unimpassioned cantilena, than modern audiences with the musico-dramatic methods of the 18th century.—Zandonai's *Francesca da Rimini*, with Alda, Martinelli, and Amato, Po-

lacco conducting, was produced on December 22nd with very moderate manifestation of interest on the part of the audience. The book, arranged by D'Annunzio himself, is skillfully constructed, excepting the introduction of an actual battle-scene (act II) on the stage, which came dangerously near the ridiculous. The composer obtained some happy local color by the employment of old instruments (piffero, lute, and viola pomposa), and also wrote beautiful music on the few occasions where his music assumes some definite form. On the whole, the themes are vague and the harmonies ultra-modern, both lacking in expressiveness.—The revival of Götze's *Taming of the Shrew* (March 15th) in commemoration of the Shakespeare tercentenary was a most unfortunate choice. For the first time since 1890 Wagner's *Rheingold* found a place in the regular repertoire outside the Ring-cycle, and proved a powerful drawing-card. *Fidelio* was revived in Mahler's arrangement, and drew moderate, but appreciative audiences. The most important début was that of Maria Barrientos (January 31st in *Lucia*), who proved herself a coloratura singer of the first rank. Although her voice is very light, scarcely sufficient in ensemble, it is wonderfully schooled, very flexible, and of sympathetic quality. Her success was instantaneous and emphatic. Claudia Muzio, a dramatic soprano with splendid histrionic powers, also scored a decided success at her début in *Tosca* (December 4th). Genaro Papi, one of the chorus masters in former seasons, made his début as one of the regular conductors with Puccini's *Manon Lescaut* (November 16th). Mr. Gatti-Casazza's contract, which had expired, was renewed for four years more. Among the principal artists were Mmes. Gadski, Kurt, Alda, Destinn, Hempel, Rappold, Ober, Matzenauer, Homer, Farrar; Messrs. Caruso, Sembach, Urlus, Reiss, Martinelli, Goritz, Weil, Braun, de Luca, Amato, Botta, Didur; conductors, Bodanzky, Polacco, Bavagnoli, Papi.

The Chicago Opera Company introduced two novelties. Massenet's *Cléopâtre*, with Kuznietsov, van Dresser, and Maguenat in the chief rôles, Campanini conducting, was given on January 10th. It is more spectacular than any other of Massenet's works, but otherwise contained nothing new; the music is graceful, melodious, and pleasing, written with that consummate mastery of technic which characterizes all of Massenet's scores.—Simon Buchhalter's *A Lover's Knot* (January 15th), with Sharlow, Hamlin, and Marr in the principal rôles, under the direction of Charlier, met with a kind reception. The libretto is decidedly weak but the music, while not remarkable, is well orchestrated. Scarcely short of a sensation was the début of a new coloratura soprano, Amelita Galli-Curci, who took her audience by storm as Gilda in *Rigoletto* (November 18th). Whenever she sang on subsequent occasions, the house was sold out. Most emphatic, also, was the success of a new tenor, Giulio Crimi, and a baritone, Giacomo Rimini, who both made their début on the same night in *Aida* (November 13th) as Radamee and Amonasro, respectively. Among the more prominent artists of the company were Mmes. Fremstad, Raisa, Farrar, Claussen, Béat; Messrs. Dalmores, Muratore, Hamlin, Dufranne, Arimondi, Journet; conductors, Campanini, Pollak, Sturani, Charlier.

The Boston National Opera Company, organized by Max Rabinoff, gave a season of 35 weeks in 45 different cities with such success that the various guarantee-funds remained intact. While presenting no new works, the performances were everywhere praised for the excellence both of the individual artists and of the ensemble. Considerable interest was shown in the Japanese soprano, Tamaki Miura, who sang Cio-Cio-San in Puccini's *Madama Butterfly*. Most of the artists (Maria Gay, Maggie Teyte, Zenatello, Baklanov, Mardones, etc.), were well known as former members of the Boston, Chicago, Montreal, and Manhattan companies.—For the first time New York had a two-weeks' season of Spanish light opera with native artists (December).—At the Metropolitan Opera House in Philadelphia W. K. Grigaitis gave the first performance in America of a Polish opera, Moniuszko's *Verbum Nobile*, in Polish (February 28th) with amateurs in the principal rôles, a chorus recruited from the singers of five Polish churches, and a part of the Philadelphia Symphony Orchestra.—At Duluth Richard Kipling brought out for the first time in American a Norwegian opera, W. Thrane's *Fjeldeventgret* in the original language (May 17th) with such success that a movement was set on foot for the organization of a permanent company for the production of Scandinavian works.—On November 27th the Interstate Grand Opera Company gave its initial performance in Cleveland amid scenes of frantic enthusiasm. The opera was *Tristan und Isolde*, sung by Rachel Frease-Green, Eleonora de Cisneros, Karl Jörn, Franz Egenieff, and Henri Scott, under the direction of Ernst Knoch. Owing to gross financial mismanagement the company had to be disbanded before the end of the second week.—After only one week the Silingardi Opera Company came to grief in New Orleans. A strike of the orchestra was given as the cause of the disaster.

**BALLET.** Seldom have expectations been raised to such a high pitch as in the case of the famous "Ballet Russe," organized and managed by Sergei Diaghilev. Reports of its phenomenal success in Paris had reached this country, and much of the music written for it by the younger Russian and French composers had been heard here in concerts. The Metropolitan Opera House went so far as to reduce its regular season, in order to give its subscribers three full weeks of the ballet (April 3rd-29th, no performances during Holy Week). For the first time since the custom was established (1904) the usual Good Friday performance of *Parsifal* was omitted. The Ballet, headed by Messrs. Nijinsky and Bolm and Mme. Lopokova, made its debut at the Century Theatre in New York on January 17th, presenting four ballets: Stravinsky's *L'Oiseau de Feu*, Tchaikovsky's *La Princesse Enchantée*, Rimsky-Korsakov's *Soleil de Nuit*, and *Scheherazade*. After a two weeks' season, the company went on tour of various cities, returned to New York for the Metropolitan engagement, toured again, and concluded with a two-weeks' engagement at the Manhattan Opera House in New York (October 15th-28th). The repertoire consisted of about 25 ballets, many written specially for the company; others were arranged to music of Chopin, Schumann (*Les Papillons*), Weber (*Invitation to the Dance*), Rimsky-Korsakov (*Sadko*), Stravinsky (*Petrouchka*), and Richard Strauss (*Till Eulen-*

*spiegel*). *L'Après-Midi d'un Faune*, arranged by Nijinsky himself, was suppressed by the police when first given, but later, with Nijinsky in the chief rôle, it gave no offense. Much of the scenery was painted by Bakst and the actions were arranged by Fokine. For some of the ballets a young American painter, Robert Edmond Jones, a disciple of Reinhardt and an exponent of the "new manner," provided highly decorative settings. The excellent orchestra was first conducted by Ernst Ansermet, later by Pierre Monteux. Some music lovers protested against the use made of the works of Chopin and Schumann and certain Metropolitan subscribers complained because the regular opera season was curtailed.

#### EUROPEAN COUNTRIES

**GERMANY.** Of operatic novelties the most important was the new version of R. Strauss's *Ariadne auf Naxos* (Berlin, November 8th). The original version, as a sequel to Molière's *Le Bourgeois Gentilhomme* (Stuttgart, 1912; see YEAR BOOK) had met with so little success that the composer took the unanimously unfavorable criticism to heart and detached the opera from the play. The new version was received with unmistakable favor. At Dresden d'Albert's latest opera, *Die toten Augen*, had its première on February 27th. Its splendid and spectacular setting contributed largely to an outward success, which critics fear will not prove lasting, because the really beautiful portions are reminiscent of the composer's earlier works. In Berlin Teresa Carreño created a sensation by her performance at a single concert of Tchaikovsky's B minor, Chopin's E minor, and Liszt's E flat concertos. Aside from her wonderful physical endurance, the critics felt that at the age of 63 this remarkable artist is perhaps even greater than ever before. At the age of 68 Lilli Lehmann gave in Vienna a concert of Mozart's compositions to raise funds toward buying the master's birthplace.

**ENGLAND.** The season of opera given by Sir Thomas Beecham was unusually successful. Beside producing for the first time in English Puccini's *Manon Lescaut*, he also brought out two novelties by English composers. Stanford's *The Critic* (January 14th) was praised highly for its original and sparkling music; while Ethel Smythe's *The Boatwain's Mate* (January 28th), the text also by the composer, made little impression. Toward the end of the season (June) *Tristan und Isolde*, the first opera by a German composer since the outbreak of the war, was given; it was received with immense enthusiasm. In May the Leeds Choir and London Symphony Orchestra combined for a six-day Elgar festival, when Sir Edward's latest work, *The Spirit of England*, had its first performance and created a deep impression. At his well-known series of Concerts of Old Music Arnold Dolmetsch now appears dressed in the costume of the times of the composers represented on his programme. In January Vladimir de Pachmann was awarded the Beethoven medal of the London Philharmonic Society.

**FRANCE.** During the year the Opéra-Comique resumed regular performances, though the repertoire was limited by the small number of artists available; 28 French and four Italian operas were given, and even two novelties, Leroux's *Les Cadeaux de Noël* and Bruneau's

*Le Tambour*. The Grand Opéra, which up to November had given only single acts of various operas, gave its first regular performance since 1914 on November 4th, reviving Chabrier's *Briséis* (not heard since 1899). Saint-Saëns, upon his appearance at the conductor's desk to direct his *Samson et Dalila*, was greeted with storms of applause; whereas the Paris première of his oratorio *La Terre Promise* (first performance Gloucester Festival, 1913) made no impression.

**Bibliography.** **DICTIONARIES.** T. Norlind, *Allmänt Musik-Lexikon* (2 vols., Stockholm), an excellent, reliable work, especially valuable for biographies of Scandinavian and Finnish artists; H. Riemann, *Musiklexikon* (8th ed., Leipzig), enormously enlarged from the 7th ed. (1909), maintains its unique position as the most complete and serviceable musical dictionary published in any language.—**BIOGRAPHY.** H. O. Anderton, *Granville Bantock* (London), well written, much information in little space; E. M. Lee, *Brahms. The Man and His Music* (London), a sympathetic presentation of biographical facts and critical estimates; *Geraldine Farrar*, by herself, evidently written to gratify a feeling of personal vanity, contains little of permanent value; R. Rolland, *Handel*, English translation by A. E. Hull (London), one of the finest critical estimates of the master; W. C. B. Sayers, *Samuel Taylor-Coleridge, His Life and Letters* (London), very detailed, but panegyric and uncritical.—**THEORY.** E. Gariel, *A New System of Harmony* (New York; published simultaneously in Spanish), constructs a simple and eminently practical system upon four fundamental chords, giving numerous examples; P. Goetschius, *The Larger Forms of Musical Composition* (New York), a clear and scholarly treatise on the forms of the classical masters as the indispensable grandwork.—**ÆSTHETICS, CRITICISM, ETC.** G. Jean-Aubry, *La Musique française d'aujourd'hui* (Paris), a collection of excellent essays, especially of critical estimates of the work of Debussy, Fauré, Ravel, Chabrier, Dukas, d'Indy, etc.; E. M. Lee, *The Story of Symphony* (New York), a practical handbook for the serious amateur; D. G. Mason, *Great Modern Composers* (New York), well written, but mainly drawn from the author's earlier books; D. C. Miller, *The Science of Musical Sounds* (New York), very scholarly and detailed; O. G. Sonneck; *Suum Quique: Essays in Music* (New York), a collection in book-form of articles of permanent value, originally published in American and German journals; C. V. Sanford and C. Forsyth, *A History of Music* (London), embodies the latest researches of modern musical scholars, but too much space allotted to the early periods in proportion to that given to modern music; D. C. Taylor, *New Light on the Old Italian Method* (New York), advocates a return to the imitative process of the older teachers; C. van Vechten, *Music and Bad Manners* (New York), contains a fine essay on Spanish music, but is chiefly concerned with futuristic music.

**MUTUAL WELFARE LEAGUE.** See **PEN-  
OLOGY.**

**MUZIO, CLAUDIA.** See **MUSIC, Opera.**

**MYERS, HENRY L.** Relected Democratic United States Senator from Montana Nov. 7, 1916.

**NAPIER, ARTHUR SAMPSON.** An English

scholar, died near Oxford, May 10, 1916. Born in Cheshire in 1853, he studied at Rugby, at Owens College, Manchester, at Exeter College, Oxford (M.A.; D. Litt.), and at Berlin. For eight years he taught in Germany, as reader of English at the University of Berlin and as professor of English at Göttingen. Professor Napier served as Merton professor of the English language and literature at Oxford from 1885 till his death, and also as Rawlinson professor of Anglo-Saxon from 1903. He received honorary doctorates from Manchester and Groningen, and became a fellow of the British Academy. Besides works in German, and contributions to journals, both in English and in German, he published: *History of the Holy Rood-Tree* (1894); *Old English Glosses* (1900); *The Franks Casket* (1901); etc.

**NATAL.** An original province of the Union of South Africa. See **SOUTH AFRICA, UNION OF.**

**NATIONAL ACADEMY OF DESIGN.** See **PAINTING AND SCULPTURE.**

**NATIONAL BANKS.** Information regarding the Federal Reserve System will be found under **BANKS AND BANKING.** See also references given there.

**STATISTICS.** According to a summary of Comptroller of the Currency John Skelton Williams, the combined return of national banks on Nov. 17, 1916, showed aggregate resources of \$15,520,000,000. It was pointed out that these resources exceeded the combined resources of all the government and semi-government banks of the world. The increase in resources during two years was \$4,028,000,000 or 35 per cent. Total resources had doubled since the spring of 1906. The percentage increase in resources by geographical divisions during the past two years was as follows: New England States, 22; Eastern, 39; Southern, 32; Middle Western, 31; Western, 50; Pacific, 33; the increase in the New England and Eastern States was in total amount almost exactly the same as that for the rest of the country. It was significant, however, that the rate of increase throughout the southern and western parts of the country was unusually rapid; and particularly was this true of the Southern States. The principal item of resources was loans and discounts of \$8,345,000,000, an increase of \$1,112,000,000 from Nov. 10, 1915. The liabilities included capital stock of \$1,071,000,000 and an exactly equal amount of surplus and undivided profits. Deposits aggregated \$12,488,000,000; an increase during the year of \$2,332,000,000. This item constituted a striking evidence of the prosperity of the country and the basis for the growth of banking strength. The reserves on November 17 totaled \$2,472,000,000, or 124.78 per cent of demand deposits. The total was \$364,000,000 greater than on Nov. 10, 1915. National banks held specie and legal tender to the amount of \$788,000,000. The aggregate due from other banks was \$2,667,000 of which \$649,000,000 was due from the Federal reserve banks. The retirement of national bank notes continued: the circulation at the close of 1916 was approximately \$725,000,000, as compared with \$1,100,000,000 two years previous when the issue of Federal Reserve notes began.

Of the aggregate reserves above mentioned central reserve cities held \$585,000,000; other reserve cities, \$725,000,000; and country banks,

\$1,162,000,000. This revealed that reserves were widely distributed throughout the country, country banks holding nearly one-half of the total. This was a reversal of conditions which prevailed at the time of the panic of 1907. All classes of banks held a larger percentage of reserves than required by law, the total excess being \$1,016,000,000. This was the greatest surplus ever reported. So great was this excess that the section of the Federal reserve act which becomes operative Nov. 16, 1917, requiring national banks to hold their entire reserve either in their own vaults or with the Federal reserve system could have been made immediately operative with very slight disturbance.

**NATIONAL BIRTH CONTROL LEAGUE.** Beginning in 1914 an active propaganda to spread knowledge of birth control came conspicuously before public attention, when Margaret Sanger was arrested for publishing articles in favor of the use of contra-conceptives in her journal, *The Woman Rebel*. She was indicted under Federal law forbidding the sending of "improper matter" through the mails. Her trial, however, was repeatedly postponed until Feb. 18, 1916, when on the motion of the assistant district attorney the indictment was quashed in the Federal District Court at New York. Meanwhile her husband was indicted for distributing leaflets containing information regarding contra-conceptives and was convicted under the New York penal code. Mrs. Sanger was subsequently indicted again under the New York statute, as were also her sister and a nurse, all connected with a "birth control clinic" established at 46 Amboy Street in Brooklyn. Their trial was set for early in January, 1917.

Meanwhile persons interested had organized the National Birth Control League, the New York Birth Control League, and the Committee of One Hundred headed by Mrs. Amos Pinchot. Moreover, since a fundamental issue in these cases was a question of free speech and free press the Free Speech League headed by Leonard D. Abbott took an active interest in defending the accused. So widespread was the interest in these prosecutions that a group of distinguished men of letters in England, including William Archer, H. G. Wells, Edward Carpenter, Gilbert Murray, and others, joined in a letter to President Wilson urging the dismissal of the indictments.

Other cases included the arrest on February 11th of Mrs. Anna Goldman for orally advocating contra-conceptives in Yiddish in New York's East Side. This was the first case of arrest for oral propaganda of birth control to come before an American court. On June 6th at New York, Bolton Hall and Mrs. Max Eastman were arrested for distributing in Union Square a leaflet prepared by Mrs. Goldman at a meeting arranged by the Birth Control League. At Boston a youth named Van Kleeck Allison was arrested for publishing in *The Flame* an extract from one of Dr. W. J. Robinson's books dealing with birth control and for otherwise giving out such information. His defense was undertaken by the Boston Birth Control League. In a hasty trial he was found guilty and sentenced to three years in the House of Correction. Upon appeal, however, the sentence was modified to 60 days' imprisonment under circumstances which vindicated him from all moral obloquy. Meanwhile this case had resulted in numerous public meet-

ings and widespread newspaper discussion, thus carrying the propaganda to all parts of New England.

Outspoken opposition to the birth control movement was variously expressed by the leaders of the Catholic Church, and the July issue of the *Relief Society Magazine*, an official publication of the Mormon Church at Salt Lake City, contained the views of 5 of the 12 elders in the supreme council of that Church, also in strong opposition. The Catholic view as set forth by Father John A. Ryan (*The Survey*, vol. xxxv, p. 671) is that any use of contra-conceptive devices constitutes a grievous sin, being an "immoral perversion of a human faculty." Such practices are believed to be "opposed to order of nature" and "in the long run bad for the individual and the race." Any artificial limitation of reproduction is looked upon as tending to cultivate softness and unwillingness to undergo pain and self-sacrifice; as creating "an atmosphere of ease, egotism, and materialism"; and as destroying courage and virility. On the contrary leading physicians, preachers, professors, and social workers declared that birth control was a great step forward in the conscious direction of individual and social life, a necessity in the interest of reducing poverty and the procreation of defectives, and a powerful factor in the elevation of the happiness of marital relations.

A unique method of propaganda was the use of the drama and the motion picture. In November, 1915, was given the first presentation at the Maxine Elliott Theatre, New York, of a three-act play, "The Unborn," by Beulah Pointer. This resulted mostly from active agitation by the *Medical Review of Reviews*. Others supporting were F. K. Robinson, Mrs. O. H. P. Belmont, John Burroughs, E. H. Gary, Judge B. B. Lindsey, Rev. C. H. Parkhurst, James Speyer, and Ella Wheeler Wilcox. A motion picture drama, "Where are My Children?" was widely shown throughout the country and attracted wide publicity through the refusal of mayors at Boston and Philadelphia to prevent its presentation.

**NATIONAL CHILD LABOR COMMITTEE.** See CHILD LABOR.

**NATIONAL CIVIC FEDERATION.** The annual meeting of the Federation was held January 17-18 in Washington, D. C. Seth Low presided. Adequate military preparedness was urged by the following speakers: Mr. Low; Henry S. Breckinridge, Assistant Secretary of War; Senator Phelan, of California; Senator Wadsworth, of New York; Representatives Gardner and Roberts, of Massachusetts, and Kelley, of Michigan; Samuel Gompers, president of the American Federation of Labor; ex-Governor O'Neal, of Alabama; and Miss Maude Wetmore, national chairman of the woman's department of the Federation. Dr. Woods Hutchinson discussed industrial hygiene, August Belmont, workmen's compensation, Prof. Jeremiah Jenks, immigration, and John Hayes Hammond reported on a survey of social and economic changes in the last 30 years. In February, a committee on military and naval preparedness was appointed, with Henry L. Stimson as chairman. Louis A. Coolidge, as chairman of the welfare department, investigated more than 300 plans of profit sharing in the United States. In August, Dr. Thomas Darlington, sent to the Mexican border by the Federation, reported on hygienic conditions in the army. To succeed Seth Low (q.v.), who

died during the year, V. Everit Macy was elected president by the executive council to serve until the next regular meeting, Jan. 23, 1917. It was announced that this meeting would be largely devoted to a discussion of industrial and military problems growing out of the European war. In November a new committee, representatives of various interests, was formed to work for better laws relating to labor disputes.

**NATIONAL CONFERENCE OF CHARITIES AND CORRECTION.** See CHARITIES.

**NATIONAL DEFENSE.** See MILITARY PROGRESS; NAVAL PROGRESS.

**NATIONAL FORESTS.** See UNITED STATES DEPARTMENT OF AGRICULTURE, *Forestry*.

**NATIONAL GALLERY OF ART.** See UNITED STATES NATIONAL MUSEUM.

**NATIONAL GEOGRAPHIC SOCIETY.** See GEOGRAPHIC SOCIETY, NATIONAL.

**NATIONAL GUARD.** See MILITARY PROGRESS.

**NATIONAL INDUSTRIAL CONFERENCE BOARD.** See TRADE UNIONS; TRUSTS, *Export Trade*.

**NATIONAL MUNICIPAL LEAGUE.** See MUNICIPAL LEAGUE, NATIONAL.

**NATIONAL MUSEUM, UNITED STATES.** See UNITED STATES NATIONAL MUSEUM.

**NATIONAL PARKS.** See PARKS, NATIONAL.

**NATIONAL PROBATION ASSOCIATION.** See PENOLOGY.

**NATIONAL SCULPTURE SOCIETY.** See PAINTING AND SCULPTURE.

**NAVAL ACADEMY, UNITED STATES.** See UNITED STATES NAVAL ACADEMY.

**NAVAL PROGRESS.** In the YEAR BOOK for 1915 reference was made to the difficulty of obtaining accurate information concerning the navies of the warring powers owing to the secrecy maintained by the naval authorities. This secrecy was still preserved, and the record for 1916 is therefore one year further removed from definite knowledge of the naval affairs of the belligerents, particularly of their building operations. This was particularly true of Germany, Austria, and Russia and almost equally so of Great Britain and France. Of the Italian navy somewhat more was known. Nor were the losses definitely known. The table of "Vessels Lost" which appears on subsequent pages is approximately correct as far as it goes, but it is undoubtedly incomplete. The Germans and Austrians concealed their losses and injuries as far as possible and the British failed to report the German submarines destroyed by gunfire or caught in their submarine nets, unless the fact had in some way become public property, because they do not wish the Germans to know the date, manner, or place of destruction. There was reason to believe that at least one battleship (old type), one battle cruiser, and many destroyers and submarines of the German navy had been destroyed in addition to those given in the list, but confirmation of the various reports was lacking.

In Great Britain building operations were said to be proceeding with great rapidity, but there was no absolute evidence that construction work on individual vessels was being carried on at a very much faster rate than before the war. Of the five battleships of the *Royal Sovereign* class which were laid down between November, 1913, and January, 1914, all had not been reported as operating with the fleet, but they were probably

completed by the end of 1916. The other vessels under construction or completed were said to be as follows: 3 battleships of the *Royal Sovereign* class (24,500 tons, 23 knots, commenced, 1914); 1 battleship of the *Queen Elizabeth* class (27,500 tons, 25 knots, commenced, 1914); 5 battle cruisers of 32 knots (commenced, 1914); 3 battle cruisers of new design (naval features not disclosed, commenced, 1915-16); 70 new destroyers of 35 to 37 knots (1914-16); a large number of submarines (1914-16), some of which were of large size (*F* class of 1200 tons and *G* class of 1500). Among the most interesting types of British new construction were the monitors. They were of three sizes, the smallest carrying two 6-inch guns; the intermediate, one 9.2-inch and one 6-inch; and the largest, two 14-inch. The hulls, which had a very shallow draft, were protected by a cellular structure on each side, which was supposed to make them torpedo-proof. The monitors were used for in-shore and river work in places where the heavy ships could not go. Three small ones were purchased from Brazil at the outbreak of the war and many larger ones were later built. All were found useful in the attack of shore works and in defense against raids by light cruisers and torpedo craft; but their low speed and unsteadiness in rough water limited their effectiveness.

Of the condition of the German navy and its new construction there was very little direct information available in 1916, though occasional developments threw some light on the subject. The battle cruiser *Ersatz-Hertha* was launched on Aug. 2, 1915, and named the *Hindenburg*. She was, therefore, on the way for two years, or from 6 to 11 months longer than her predecessors. Apparently, this indicated a partial reconstruction on account of radical changes, or else a decreased speed in building. A few months later the Netherlands government received very favorable proposals from the Germania Works for the construction of two 7000-ton fast cruisers. It may therefore be concluded that the German shipbuilding establishments were not pressed with orders. Three battleships of the *T* class (29,000 tons, 8 15-inch guns) were under construction when the war broke out. Two at least should have been completed and the third may be. It was stated that in 1915 or earlier the Germans were considering battleships of 25 knots speed, triple bottoms, and carrying 8 16-inch guns in four turrets, and it was rumored that at least two had been commenced. Of the four battle cruisers building in 1914, the *Lutzow* and *Derfflinger* were completed and the former sunk in the battle of Jutland. As already stated, the completion of the *Hindenburg* was apparently delayed, though finished in time to take part in the Jutland fight. Perhaps the *Ersatz-Victoria Luise* may have fared better. There was not even a rumor that Germany had begun any battle cruisers since the war began, but of course she had probably done so. She was, however, said to be building several fast cruisers and some commerce destroyers which she hoped to get past the British blockade. In addition to the vessels of improved *Graudenz* type, the *Neue Zuercher Post* described submergible cruisers of 5000 tons (submerged) carrying medium calibre guns in a turret, and having a cruising radius of 18,000 to 20,000 miles (see BATTLESHIPS AND OTHER WAR VESSELS). According to the same

authority, the latest German submarines had a submerged displacement of 2400 tons, double hulls, and a speed of 22 knots on the surface. To augment the strength of the German naval forces operating in the Baltic, some of the old cruisers and coast defense ships (*Egir* class, 4000 tons, armored) were fitted along their sides with coffer-dam defense against torpedoes. There were numerous conflicting reports as to the building of destroyers and torpedo boats, but undoubtedly many had been completed and many others were building at the end of the year.

Since the outbreak of the great war the French navy had not, so far as known, begun any battleships or battle cruisers. The building of the four battleships designed to carry 16 13.4-inch guns was deferred until after the war; and, although a study had been made of battle cruiser design, none of this class had been laid down. Apparently the French thought that their British allies had the naval situation well in hand and that they best could apply their own energies and funds to land operations. While no battleships had been commenced and the carrying out of the regular building programme had been deferred, the *Moniteur de la Flotte* is responsible for the statement that a motor battleship was to be laid down. The engines were to have a horse power of about 18,000 and the speed was to be "moderate." The displacement was not stated nor was the number of guns given, but they were to be mounted in 4-gun turrets. Up to the end of 1916 the ship building facilities had been confined to work on the five battleships of the *Flandre* class, 24,800 tons, 12 3.4-inch guns), completing the *Lorraine*, *Bretagne*, and *Provence* (23,000 tons, 10 13.4-inch guns), which were said to be ready for service, and some new destroyers and submarines. While the French navy had a large number of destroyers, they were mostly small (all but 18 were less than 460 tons), so that larger and more seaworthy boats were needed, and some were said to be in hand. As in other navies, many old ships which were practically discarded were repaired and put in service for special work. The commissioning of reserved and other vessels had brought the personnel of the navy up to about 100,000.

All of the war vessels building for the Russian navy at the outbreak of the war were completed, with the exception of two fast cruisers of 7085 tons, and these may have been finished also. About 30 large destroyers had been completed since 1914 and it was believed that a still larger number were under construction. Like the other warring nations, Russia had completed many submarines since 1914 and was building others; of these 150 were transportable boats of about 60 tons, and the others were from 500 to 1000 tons. The Russian navy received doubtful reinforcement by the purchase of three of her old vessels which were captured by Japan; these were the battleships *Tango* (ex-*Poltava*) and *Sagami* (ex-*Peresviet*) and the protected cruiser *Soya* (ex-*Variag*). The sum paid was \$7,750,000. Unfortunately, the *Peresviet* was wrecked in a fog a few days after being taken over. Another and greater loss to the Russian navy was the new dreadnought *Imperatrissa Maria*, which caught fire near one of her magazines, blew up, and sank. As she lay in very shoal water, and the explosion involved only the vicin-

ity of one of the magazines, it was thought she could be raised and repaired.

All of the vessels building for the Italian navy in 1914 had been completed by 1915, with the exception of four battleships (30,000 tons, 25 knots, 8 15-inch guns) which were commenced in the spring and summer of that year. The new vessels which later were commenced comprised 3 large destroyers, or flotilla leaders, of 1500 tons; 19 submarines; and some auxiliary vessels. The Italian navy was very unfortunate in the war. It had not only failed to inflict serious loss upon the Austrians, but it had two armored cruisers sunk, and two of its battleships—one of them its latest dreadnought—were blown up by accident. These two explosions were not explained. The Italian ammunition was of the same type as the British. Great Britain had lost one battleship, one armored cruiser, and one auxiliary cruiser by similar explosions, and unofficial reports laid the blame on careless handling of ammunition. And, as stated in the preceding paragraph, the Russian dreadnought *Imperatrissa Maria* was destroyed on Oct. 20, 1916. Whether the quality of her ammunition had anything to do with the matter is not yet established.

According to the Japanese press there were five superdreadnoughts built or building in Japan in 1916, and the navy was to request authority to build three more in the next seven years. The programme was also said to include two battle cruisers which were to be completed within the same period. The superdreadnoughts were four vessels of the *Fuso* class (30,000 tons, 22 knots, 12 14-inch guns) and one new battleship of 32,000 tons (23 knots, 12 15-inch guns). Of the *Fuso* class, only the *Fuso* was completed, but the others were well advanced and one was nearly ready for service at the end of the year. The new ship of 32,000 tons, the *Nagato*, was commenced in the spring of 1916. It was expected to lay down one more vessel of this class each year (1917, 1918, 1919). The battle cruisers were likely to be deferred until all of the *Fuso* class were completed. These were to surpass in speed the German *Hindenburg* and, while slower than the American battle cruisers, were to have greater gun power. Two or more fast light cruisers of about 5000 tons were to be taken in hand, also several more destroyers (two at least were building in 1916) of about 1200 tons, resembling those of the *Urakaze* type, previously placed in commission. Some of the submarines contemplated were to be large enough for deep-sea voyages and have a cruising radius of at least 4000 miles.

With the exception of the miscellaneous activities of its small cruisers, torpedo boats, destroyers, submarines, and air craft the Austrian navy did not engage in any operations. Four new dreadnought battleships of 24,500 tons were to be laid down in 1914-15, but comparatively late reports stated that none of these had been commenced. It was quite certain, however, that the last battleship of the *Viribus Unitis* class (20,000 tons) was completed soon after the war broke out. Three fast light cruisers of about 4800 tons were to be laid down in 1914-15. One (*L*) was said to have been completed, one (*K*) was destroyed at Monfalcone, and one was thought to be under construction and nearly finished in 1916. Three fast light cruisers of 3600 tons and 32 knots speed were

building at Monfalcone in 1914 for the Chinese navy. As all three had been launched before the Italians took possession it was probable that they were taken over by the Austrian navy, towed elsewhere, and then completed. One destroyer of 400 tons, building for China at Trieste, and two submarines of 320 tons, building for Holland at Fiume, were taken over by the Austrian government at the outbreak of war.

The greatest relative change in the constructive plans of any navy was made in the United States. The Naval Act of 1916 appropriated about \$315,000,000 and provided for a very large constructive programme, as follows: 10 battleships of the largest and most powerful type; 6 battle cruisers to have an armament as powerful as any of their class, and to have the highest practicable speed, and the greatest desirable radius of action; 10 scout cruisers and 50 torpedo boat destroyers of the highest practicable speed and greatest desirable radius of action; 9 fleet submarines, 58 coast submarines, and 1 equipped with the Neff system of submerged propulsion; 3 fuel ships; 1 repair ship; 2 destroyer tenders; 1 fleet submarine tender; 2 ammunition ships; and two gunboats. The act also extended the authority and duties of the chief of operations and he was made the head of the new bureau of operations in the Navy Department. As organized this practically formed a naval general staff and was the greatest advance made in recent years in the preparation of the navy for war. The reserve force of the navy was entirely reconstructed by the act and consists of (1) the Fleet Reserve, composed of officers and men who have served in the navy; (2) the Naval Reserve, those who are or have been engaged in the sea-going profession and have qualified for service on fighting ships; (3) the Naval Auxiliary Reserve, those of the sea-going profession whose knowledge and experience fit them for duty on the navy auxiliaries; (4) the Naval Coast Defense Reserve, those capable of performing useful service in the navy in defense of the coast; (5) the Volunteer Naval Reserve, those eligible to serve in any of the foregoing classes but who obligate themselves to do so without retainer in times of peace; (6) the Naval Reserve Flying Corps, those transferred from the Naval Flying Corps. The act also established the Naval Flying Corps, reorganized and improved the standing of the Naval Dental Corps, fixed the total number of officers of all corps at 4 per cent of the enlisted

strength as provided by law, and also the proportionate number of officers in all grades and corps. The total personnel of the navy was fixed at 3000 officers and 75,000 men. The act also allotted \$8,000,000 for the further equipment of navy yards for ship building.

Of the vessels mentioned in the foregoing paragraph, the following were to be laid down at once, the others before July 1, 1919: 4 battleships, to cost not more than \$11,500,000 each, exclusive of armor and armament; 4 battle cruisers, cost not to exceed \$16,500,000 each, exclusive of armor and armament; 4 scout cruisers, limit of cost \$5,000,000 each, exclusive of armor and armament; 20 destroyers, limit of cost, \$1,200,000 each, exclusive of armor and armament; 3 coast submarines of about 800 tons, limit of cost, \$1,200,000 each; 27 other coast submarines, limit of cost \$700,000 each; 1 Neff submarine of about 150 tons, limit of cost \$250,000; 1 fuel ship, limit of cost \$1,500,000; 1 hospital ship, limit of cost \$2,350,000; and two ammunition ships, limit of cost \$860,000 each. The amount of money actually appropriated by the bill, \$59,000,194, was allotted for hulls and machinery of vessels authorized, \$4,110,000 for armor and armament, and \$19,485,500 for ammunition supply.

The new battleships were to be of 32,600 tons, 21 knots speed, and to carry eight 16-inch guns. The scout cruisers were to be of 7100 tons, 35 knots speed, and carry eight 6-inch guns. The destroyers were to have a displacement of 1185 tons, a speed of 35 knots, and carry four 4-inch guns. The characteristics of the armored cruisers were not fully settled, but it was understood that they would be very large, carry 16-inch guns, and have a speed of 35 knots. Details in regard to submarines were not published. For number and tonnage of vessels built and under construction, see table.

Of the minor naval powers the Netherlands were building 2 fast cruisers of 7000 tons and 30 knots speed; and 4 submarines of 836 tons and 17.5 knots. Portugal was building 2 gunboats, 2 destroyers, and 3 submarines. Spain had 2 battleships under construction (1 was nearly completed) and had a building programme of 4 fast cruisers, 6 destroyers, 28 submarines, 3 gunboats, and 18 coast guard mine layers. Some of these were under construction and a few were completed; one submarine was built in the United States and finished about the end of 1916.

VESSELS BUILT AND BUILDING

In the Navies of the World, January 1, 1917

Class of Ship	GREAT BRITAIN				GERMANY			
	Built		Building		Built		Building	
	No.	Tons	No.	Tons	No.	Tons	No.	Tons
Battleships (Dreadnought type) . . . . .	38*	892,850	4*	112,000	16*	894,175	3*	96,000
Battleships (Pre-dreadnoughts) . . . . .	26	886,750	..	..	19	230,058	..	..
Battle cruisers . . . . .	6*	186,000	8*	255,000	5	123,040	3*	90,000
Coast defense vessels . . . . .	20*	40,000	5*	12,500	..	..	..	..
Armored cruisers . . . . .	23	270,280	..	..	3	28,879	..	..
Fast light cruisers . . . . .	42	171,500	10*	50,000	13	54,588	8*	50,000
Other cruisers . . . . .	23	141,650	..	..	11	41,070	..	..
Destroyers . . . . .	252	193,205	50*	70,000	166	102,600	40*	35,000
Torpedo boats . . . . .	119	17,875	..	..	44	7,900	20	3,000
Submarines . . . . .	91*	44,589	30*	33,000	60*	50,000	60*	70,000
Total . . . . .	640	2,294,499	107	582,500	387	1,032,110	184	344,000

747 ships = 2,826,999 tons.

471 ships = 1,376,110 tons.



Class of Ship	UNITED STATES				FRANCE			
	Built		Building		Built		Building	
	No.	Tons	No.	Tons	No.	Tons	No.	Tons
Battleships (Dreadnought type) . . . . .	12	807,450	5	160,000	7	161,662	6	144,000
Battleships (Pre-dreadnoughts) . . . . .	21	297,936	4	130,400 (b)	15	227,091	..	.....
Battle cruisers . . . . .	4	12,900	..	(a)	2	19,530	..	.....
Coast defense vessels . . . . .	4	172,045	..	..	17	179,859	..	.....
Armored cruisers . . . . .	3	11,250	4	28,400 (b)	3	21,648	6*	39,000
Fast light cruisers . . . . .	8	26,060	..	..	4	16,657	..	.....
Other cruisers . . . . .	64	49,193	10	10,662	86	38,662	20*	20,000
Destroyers . . . . .	18	3,800	20	28,700 (b)	189	18,514	..	.....
Torpedo boats . . . . .	48	..	32	..	88	41,851	20*	16,000
Submarines . . . . .	..	..	30	(b)	..	..	..	.....
<b>Total</b> . . . . .	<b>187</b>	<b>880,184</b>	<b>109</b>	<b>853,102</b>	<b>411</b>	<b>724,474</b>	<b>52</b>	<b>219,000</b>

296 ships = 1,233,236 tons.

463 ships = 943,474 tons.

Class of Ship	JAPAN				RUSSIA			
	Built		Building		Built		Building	
	No.	Tons	No.	Tons	No.	Tons	No.	Tons
Battleships (Dreadnought type) . . . . .	3	72,900	4	125,900	6	137,000	2*	55,000
Battleships (Pre-dreadnoughts) . . . . .	11	168,330	1	32,000 (b)	7	99,578	..	.....
Battle cruisers . . . . .	4	110,000	..	..	4	130,000	..	.....
Coast defense vessels . . . . .	1	4,126	..	..	1	8,880	..	.....
Armored cruisers . . . . .	13	187,632	..	..	5	56,155	..	.....
Fast light cruisers . . . . .	5	20,800	2*	10,000 (b)	9	60,945	2*	(f)
Other cruisers . . . . .	9	82,645	..	..	1	6,731	..	.....
Destroyers . . . . .	58	31,405	2*	2,400	139	86,055	40*	(f)
Torpedo boats . . . . .	54	5,569	..	..	19	2,682	..	.....
Submarines . . . . .	15	3,894	4*	3,200	48	19,300	150*	38,000
<b>Total</b> . . . . .	<b>173</b>	<b>586,801</b>	<b>13</b>	<b>173,500</b>	<b>239</b>	<b>607,826</b>	<b>194</b>	<b>93,000</b>

186 ships = 760,301 tons.

433 ships = 700,826 tons.

Class of Ship	ITALY				AUSTRIA			
	Built		Building		Built		Building	
	No.	Tons	No.	Tons	No.	Tons	No.	Tons
Battleships (Dreadnought type) . . . . .	5	108,266	4	120,000	4	80,040	..	.....
Battleships (Pre-dreadnoughts) . . . . .	7	82,205	..	..	6	74,100	..	.....
Battle cruisers . . . . .	..	..	..	..	..	..	..	.....
Coast defense vessels . . . . .	..	..	..	..	6	41,160	..	.....
Armored cruisers . . . . .	6	50,119	..	..	3	18,503	..	.....
Fast light cruisers . . . . .	3	10,884	..	..	7	23,852	1	4,800
Other cruisers . . . . .	4	11,860	..	..	3	8,465	..	.....
Destroyers . . . . .	48	20,935	3*	4,500	18	8,778	6*	4,800
Torpedo boats . . . . .	84	12,423	..	..	67	12,853	..	.....
Submarines . . . . .	17	4,861	19*	12,504	16	7,477	10*	10,040
<b>Total</b> . . . . .	<b>169</b>	<b>300,003</b>	<b>26</b>	<b>137,004</b>	<b>130</b>	<b>274,728</b>	<b>17</b>	<b>19,640</b>

195 ships = 437,007 tons.

147 ships = 294,368 tons.

\* Exact numbers and tonnage unknown; figures given are based on the best information available.

(a) Details of design not yet settled.

(b) To be commenced as soon as practicable.

Vessels 20 years old (unless recently rebuilt) and of less than 1,500 tons (exclusive of torpedo craft) are not included. Tonnage of United States submarines omitted in deference to wishes of the Navy Department.

NAVAL OPERATIONS IN 1916. The naval operations and incidents of the year were not, aside from the battle of Jutland, particularly noteworthy. The British fleet continued to give the world a shining example of the value of sea power by shutting off Germany from all sea-borne supplies except the small quantities which occasionally came across from Norway and Sweden, and even this traffic was almost stopped. The prevention of import of cotton, copper, rubber, zinc, tin, petroleum, and foodstuffs greatly hampered the Central Powers in the production of munitions of war, and it is probable that it seriously interfered with their military operations and affected the spirits of the people and to some extent the morale of the troops.

The German submarine war against commerce was much modified early in the year, and later, while the German government took up a new and indefensible attitude towards neutral ship-

ping, very little effort was made to carry out its declarations. A very considerable portion of the Germans were beginning to have doubts of the advisability of ruthless submarine war against non-combatant shipping. First, it did not appear to have achieved its end—the destruction of the enemy's commerce and very serious curtailment of his supplies of food and munitions of war; and secondly, it was very costly of life and vessels in the submarine service. According to some authorities the Germans had lost 150 to 175 submarines up to July 1, 1916. Others placed the loss lower, but all seemed to agree that the submarine warfare had been carried on at a tremendous cost of men and vessels. The following tables show the number of merchant vessels sunk, or otherwise destroyed, between Aug. 1, 1914, and June 1, 1916. It does not include captures, seizures, or intern-

## BELLIGERENT VESSELS DESTROYED

Country	Ships	Tonnage
Great Britain	684	1,419,580
Germany	69	177,580
France	67	162,417
Russia	35	42,849
Italy	24	49,197
Belgium	12	22,931
Japan	8	19,267
Austria-Hungary	6	10,824
Turkey	12	11,381
Portugal	1	620
	918	1,916,096

## NEUTRAL VESSELS DESTROYED

Country	Ships	Tonnage
Holland	48	181,833
Norway	90	181,488
Sweden	45	49,999
Denmark	38	55,605
Greece	10	17,477
United States	6	14,583
Spain	4	8,606
Rumania	1	285
Persia	1	758
	238	890,134

From later reports it appears that 36 of the merchantment belonging to belligerents and 15 belonging to neutrals were eventually refloated or otherwise saved and carried into port for repairs.

The last serious incident of 1915 was the loss of the British armored cruiser *Natal*, which was destroyed on December 30th by an internal explosion while at anchor in a British port. The cause was not revealed, but rumor stated that this accident, like those which caused the destruction of the *Bulwark* and *Princess Irene*, was due to the careless handling of high explosive shell. The Italian and Russian navies used similar ammunition. The former had lost the battleships *Benedetto Brin* and *Leonardo da Vinci* and the latter the battleship *Imperatrice Maria*, all by explosions while at anchor in port. The causes of the accidents were not given out.

The first naval operations in 1916 were connected with the evacuation of the Gallipoli Peninsula and giving up the badly planned and worse conducted Dardanelles campaign. The evacuation was completed with little loss on January 8-9, 1916. It is a noteworthy fact that 49 hospital ships were employed in connection with the Dardanelles operations.

The first notable incident in North Sea-Baltic operations was the loss of the British battleship *King Edward VII* (16,350 tons), which was sunk by a mine on the east coast of England on January 9th. On January 28th, the British government announced a general control of the whole British merchant marine. On February 2nd, the fast cruiser *Arctusa* was sunk by a mine off the English coast. During the latter part of the month, the Germans planted mines on the British coast between Folkestone and Dover and three large steamers were sunk by them.

On February 29th, the British auxiliary cruiser *Alcantara*, cruising north of Scotland, hailed a vessel with Norwegian colors painted on her side, apparently a Norwegian merchantman. The challenged ship proved to be the German auxiliary cruiser *Greif* (of about 10,000 tons) and she immediately opened fire. In the fight which ensued the *Greif* was sunk by the

guns of the *Alcantara*, but just before going down she discharged a torpedo which sank her opponent. The *Alcantara* was formerly a merchant steamer of about 16,000 tons.

On March 5th, the German auxiliary cruiser *Moeve* passed safely through the British blockade to a German port. In two months she had captured and destroyed 1 French, 1 Belgian, and 12 British vessels. One other British steamer, the *Appom*, was sent to the United States with the crews of the vessels destroyed. It is presumed that the *Greif* was designed for the same class of work as the *Moeve* and was endeavoring to get to sea when she met the *Alcantara*.

On March 20th, a British submarine in the Baltic captured a merchant vessel and sent it into port in charge of a small prize crew. On the same date there was an engagement between four British and three German destroyers. The latter escaped into Zeebrugge without serious injury. Between March 23rd and March 27th a British expedition scouting along the German coast met the German scouts. The old British cruiser *Medusa* was sunk, also one German destroyer.

On April 25th, a German scouting expedition, consisting of several battle cruisers, fast light cruisers, submarines, and destroyers, appeared off Lowestoft and Great Yarmouth, on which they opened fire. After about 20 minutes' firing, in which no great damage was done, they retired to the eastward. This expedition was probably designed to locate the British battle cruiser squadron and to see if any of the British battle fleet was in the vicinity. During April 23rd-24th, the British monitors, cruisers, destroyers, and other vessels and aircraft operating along the Belgian coast, bombarded the German destroyer and submarine base at Zeebrugge and the German batteries at Heyst, Blankenberghe, and Knocke. According to reports from Amsterdam the firing did enormous damage, especially at Zeebrugge. On April 27th, the German submarine *UC-5*, built and used as a mine layer, was captured.

In May, previous to the 31st, no operations of importance took place, but on that day occurred the greatest naval battle of the war. The Germans state that their high seas fleet was cruising in the Skager-Rak for the purpose of offering battle to the British, as they had done on previous occasions. Their force consisted of five battle cruisers of the *Derfflinger* and *Moltke* classes (presumably the *Lutrow*, *Hindenburg*, *Derfflinger*, *Seydlitz*, and *Moltke*), three battle squadrons (17 dreadnoughts, 8 pre-dreadnoughts), a number of fast light cruisers and several destroyer flotillas. The battle cruiser squadron was commanded by Vice-Admiral von Hipper, the high seas fleet by Vice-Admiral von Scheer. The British force, which was making one of its periodical sweeps through the North Sea, consisted of: (a) the fast battle fleet under Vice-Admiral Beatty, composed of the battle cruisers *Tiger*, *Lion*, *Princess Royal*, *Queen Mary*, *Indefatigable*, and *New Zealand*, the 5th battle squadron (Rear-Admiral Evan Thomas) of four fast battleships (*Barham*, *Valiant*, *Warspite*, *Malaya*—25 knots), and several fast light cruisers and squadrons of destroyers; (b) the main fleet under Admiral Jellicoe, composed of about 25 dreadnought battleships, the third battle

cruiser squadron (Rear Admiral Hood) of 3 battle cruisers (*Invincible*, *Inflexible*, *Indomitable*), an armored cruiser squadron (Rear Admiral Arbuthnot) of 4 old armored cruisers (*Black Prince*, *Duke of Edinburgh*, *Defence*, and *Warrior*), and numerous fast light cruisers and destroyer flotillas.

On the afternoon of May 31, 1916, Vice-Admiral Beatty with his command, was scouting ahead of the main force of the grand fleet and about 50 miles south of it, his light cruisers in advance. At 2.20 P. M. the light cruiser *Galatea* reported the presence of the enemy and at 2.35 considerable smoke to the eastward was seen from the flagship. Beatty turned to the east and then northeast, being satisfied that the enemy was northeast of him. About 3.30 he formed his battle cruisers in column, heading ENE, with 2 destroyer flotillas ahead, and increased his speed to 25 knots. The fifth battle squadron was on his port beam, about 10,000 yards away, and two light cruiser divisions were scouting ahead of it. At 3.31 the enemy, consisting of five battle cruisers, some light cruisers, and several torpedo flotillas, was sighted heading about SSE. Beatty changed course to ESE, converging on the course of the enemy now about 23,000 yards away. At 3.48 both sides opened fire at a range of about 18,500 yards. The wind was light from NW, and the sea was smooth, but the weather was misty and visibility of distant objects not good, especially to the southeast. Upon reaching a range of 14,500 yards, Beatty turned to the southward, laying a course parallel to the enemy. About 4 o'clock, an explosion took place on the *Indefatigable*, the last ship in Beatty's battle cruiser column, and she quickly sank. At 4.08 the fifth battle squadron (Thomas) opened fire at about 20,000 yards. At 4.15 both British and German destroyers moved out to attack. The Germans were driven back and the British pressed forward to attack the German battle cruisers. In this operation the *Nestor*, *Nomad*, and two German destroyers were sunk. About 4.30, following an explosion on board, the *Queen Mary* sank. At 4.42 the main German fleet was sighted ahead approaching from the southward. Beatty then countermarched and headed NNW at full speed, the fifth battle squadron following the battle cruisers. This brought them quite close to the German main fleet which was coming up rapidly. Von Hipper countermarched his column immediately after Beatty. Between 5 and 6 o'clock the Germans were more or less obscured by the mist. About 5.45 the British destroyers again attacked, but the Germans say that no damage was inflicted. An unofficial report states that at this time only four German battle cruisers were in Hipper's column. Beatty gradually drew ahead after turning, but when he reached 1400 yards he turned slightly towards the eastward and the Germans did the same. At 5.56 Beatty sighted the leading ships of the main British fleet bearing north. He then turned more to the eastward and reduced the range to 1200 yards. Only three battle cruisers were left in the German battle cruiser column at this time. The leading ships of Jellicoe's force were the armored cruisers division under Arbuthnot and the battle cruiser division under Hood. The latter was directed to report to Beatty and formed in column ahead of Beatty's

flagship (the *Lion*). As Hood was getting into position the armored cruisers *Defence* and *Warrior* were seen passing between the British and German fleets under heavy fire. While driving off a torpedo attack and destroying the German light cruiser *Wiesbaden*, they sighted the German main fleet advancing through the mist. The *Defence* was sunk but the *Warrior* was temporarily saved by the battleship *Warspite*, whose steering gear had jammed and carried her out of her column. Before she got under command she sustained a hot fire at close range from several German battleships but she made a spirited fight and got away. At 6.20 Hood was only 8000 yards from the nearest German ship and a few minutes later the *Invincible* sank. The main British fleet had formed in column and was now following Beatty's vessels. The flagship *Marlborough* was hit by a torpedo at 6.17, but as it only gave her a slight list she continued to keep her place in column. The British fleet endeavored to close by changing course more to the eastward, then to south and west, but the Germans made similar changes, so that the distance between the fleets remained practically the same. Both British and German accounts agree that after the British main fleet arrived, the opposing fleets were only able to see vessels of the other side at intervals on account of the mist and smoke. After 7.45 they lost sight of each other until 8.30, when Beatty sighted the Germans and was heavily engaged with them for a short time. During the night Jellicoe maneuvered to keep between the German fleet and its base while Beatty pushed to the eastward to get between it and the coast of Jutland. Several destroyer attacks were made by both sides before dark and during the night. The results were that the British lost the armored cruiser *Black Prince*, the flotilla leaders *Tipperary* and *Turbulent*, and the destroyers *Ardent*, *Fortune*, and *Sparrowhawk*. The destroyer *Shark* was sunk in an earlier attack about 6.16. The Germans lost the old type battleship *Pommern*, the cruiser *Frauenlob* and several destroyers. At daylight the British cruised to the northward seeking the German fleet and the Germans said they cruised to the southward during the night seeking the British fleet. At 1.15 P. M. the British squadrons left for their respective bases.

The British losses in the battle were: battle cruisers *Queen Mary* (27,000 tons), *Indefatigable* (18,750 tons), *Invincible* (17,250 tons); armored cruisers *Defence* (14,600 tons), *Warrior* (13,660 tons)—she sank on her way to England but her crew was saved—*Black Prince* (13,660 tons); flotilla leaders *Turbulent* (1850 tons), *Tipperary* (1850); destroyers *Nestor* (1200), *Nomad* (1200), *Ardent* (935), *Fortune* (935), *Shark* (935), *Sparrowhawk* (935). The Germans report their losses as: battle cruiser *Lutzow* (28,000 tons), pre-dreadnought battleship *Pommern* (12,997), fast light cruisers *Elbing* (5440), *Wiesbaden* (5000), *Rostock* (4822), the old cruiser *Frauenlob* (2672), and five destroyers.

A few days after the battle of Jutland, the British armored cruiser *Hampshire* struck (June 6th) a mine off the coast of Scotland and sank. Lord Kitchener, several other prominent Englishmen, and nearly all the crew were lost. Later in the month, an unimportant fight took place between the German and Russian scout-

ing forces in the Baltic. On July 22nd, German destroyers appeared off the mouth of the Thames, but did little damage before being driven off. During July the *Deutschland*, a large merchant submarine, made a trip to the United States, carrying dyestuffs and other valuable cargo. She left on August 1st, for her return voyage, carrying an equally valuable lading. A sister boat, the *Bremen*, was supposed to have been captured or sunk by the British.

On August 19th the German fleet came out again. The light cruisers, destroyers, and submarines met the British scouts, and the British fleet was called out at once. After an engagement between the scouting forces in which the British fast cruisers *Falmouth* and *Nottingham* were sunk by submarines, the German forces retired, but not until the dreadnought battleship *Westfalen* (18,600 tons), was torpedoed and seriously injured. The German admiralty admitted the injury to the *Westfalen* but said no German vessels were lost.

In October the German submarine *U-53*, which had crossed the Atlantic and called at Newport, R. I., on its return to Germany sank several merchant vessels off Nantucket, two of which were owned by neutrals. A short time afterwards the *Deutschland* arrived in the United States on a second trip.

The naval operations and incidents of the year in the Mediterranean were of no special effect on the course of the war. The forces of the Entente Allies continued to apply pressure upon Greece to join their side and were otherwise busily engaged in searching for the enemy's submarines and submarine bases. In February the *Amiral Charner* (French armored cruiser) was sunk off the coast of Asia Minor by a submarine; and the British battleship *Russell*, of pre-dreadnought type, was sunk by a mine in April. Sometime in August the Italian battleship *Leonardo da Vinci*, dreadnought type, and Italy's newest battleship, caught fire and blew up while at anchor in the harbor of Taranto; while the Russian battleship *Imperatrix Maria*, dreadnought type, was destroyed under similar conditions on the 20th of October.

The operations in the Adriatic, Aegean, eastern Mediterranean, and Black Sea seemed to have no purpose except to annoy the enemy and interfere with submarine warfare. No systematic attempt to obtain control of the Adriatic or Black Sea was made. The Austrian vessels operated freely in the former; and the *Goeben* and *Breslau* did likewise in the Black Sea, though they carefully avoided the regions where the Russian navy was likely to be found in force. The anti-submarine warfare was partially successful and the activity of the German and Austrian submarines was much reduced during the year. See AERONAUTICS; BATTLESHIPS AND OTHER WAR VESSELS; SUBMARINES; UNITED STATES AND THE WAR; WAR OF THE NATIONS; and section on *Navy* under each country.

WARSHIP LOSSES

Of the various navies from August 1, 1914, to December 31, 1916

GREAT BRITAIN				
Name of Ship	Type	Tonnage	How Lost	Date
Audacious	B.D.	25,000	M.	27-10-14
King Edward VII.	B.	16,850	M.	9-1-16
Bulwark	B.	15,000	Ex. A.	26-11-14

Name of Ship	Type	Tonnage	How Lost	Date
Formidable	B.	15,000	S.T.	1-1-15
Irresistible	B.	15,000	M.	18-8-15
Majestic	B.	14,900	S.T.	27-5-15
Russell	B.	14,000	M.	26-4-16
Ocean	B.	12,950	M.	18-8-15
Soliath	B.	12,950	T.	12-5-15
Triumph	B.	11,800	S.T.	26-5-15
Queen Mary	B.C.	27,000	G.	31-5-16
Indefatigable	B.C.	18,750	G.	31-5-16
Invincible	B.C.	17,250	G.	31-5-16
Defence	A.C.	14,600	G.	31-5-16
Goodhope	A.C.	14,100	G.	1-11-14
Naval	A.C.	13,660	Ex. A.	30-12-15
Warrior	A.O.	13,660	G.	31-5-16
Black Prince	A.C.	13,660	G.	31-5-16
Aboukir	A.O.	12,000	S.T.	22-9-14
Cressy	A.C.	12,000	S.T.	22-9-14
Hogue	A.O.	12,000	S.T.	22-9-14
Argyll	A.C.	10,850	W.	28-10-15
Hampshire	A.C.	10,850	M.	6-6-16
Monmouth	A.C.	9,800	G.	1-11-14
M.30	Mon.	(?)	G.	18-5-16
Nottingham	F.C.	5,440	S.T.	19-8-16
Falmouth	F.C.	5,250	S.T.	19-8-16
Arcthusa	F.C.	3,600	M.	14-2-16
Penelope	F.C.	3,600	G.	25-4-16
Amphion	F.C.	3,360	M.	6-8-14
Pathfinder	F.C.	2,940	S.T.	5-9-14
Hawke	C.	7,350	S.T.	13-10-14
Hermes	C.	5,600	S.T.	31-10-14
Medusa	C.	2,800	Col.	8-16
Pegasus	C.	2,135	G.	20-9-14
Speedy	G.B.	810	M.	8-9-14
Niger	G.B.	8,100	S.T.	11-11-14
Figard II	B.O.	6,010	F.	17-9-14
Turbulent	D.	1,850	G.	31-5-16
Tipperary	D.	1,850	G.	31-5-16
Lassoo	D.	1,500	Sk.	13-8-16
Nomad	D.	1,200	G.	31-5-16
Nestor	D.	1,200	G.	31-5-16
Maori	D.	1,035	M.	7-5-15
Louis	D.	965	W.	10-11-15
Ardent	D.	935	G.	31-5-16
Fortune	D.	935	G.	31-5-16
Lynx	D.	935	M.	10-8-15
Shark	D.	935	G.	31-5-16
Sparrowhawk	D.	935	G.	31-5-16
Eden	D.	555	Col.	16-6-16
Erne	D.	550	W.	-2-15
Recruit	D.	385	S.T.	1-5-15
Flirt	D.	380	G.	26-10-16
Bullfinch	D.	370	Col.	18-8-14
Coquette	D.	355	M.	-8-16
Unknown	D.	(?)	W.	27-12-14
No. 10	T.B.	244	S.T.	10-6-15
No. 11	T.B.	253	M.	2-3-16
No. 12	T.B.	253	S.T.	10-6-15
No. 96	T.B.	130	Col.	1-11-15
A-E-1	S.	810	F.	14-9-14
A-E-2	S.	810	G.	30-4-15
D-2	S.	600	Miss.	unknown
D-5	S.	600	M.	8-11-14
E-3	S.	810	M.	18-10-14
E-7	S.	810	T.(?)	4-9-15
E-10	S.	810	Miss.	unknown
E-13	S.	810	W.	19-8-15
E-15	S.	810	W.	18-4-15
E-17	S.	810	SK.	6-1-16
E-20	S.	810	T.(?)	5-11-15
E-22	S.	810	SK.	25-4-16
Unknown	S.	(?)	W.	20-1-16
Oceanic	Aux. C.	17,274	W.	8-9-14
Alcantara	Aux. C.	15,800	T.	29-2-16
India	Aux. C.	7,900	S.T.	10-8-15
Rohilla	Aux. C.	7,400	W.	30-10-14
Tara	Aux. C.	6,322	S.T.	5-11-15
Princess Irene	Aux. C.	6,000	Ex. A.	27-5-15
Bayano	Aux. C.	5,948	S.T.	12-8-15
Viknor	Aux. C.	5,386	SK.	14-1-15
Clan Macnaughton	Aux. C.	4,985	F.	8-2-15
Ramsay	Aux. C.	(?)	G.	8-8-15
Duke of Albany	Aux. C.	1,977	S.T.	24-8-16
Royal Edward	Tran.	11,117	S.T.	14-8-15
Ramazan	Tran.	3,477	S.T.	17-9-15
Marquette	Tran.	7,057	S.T.	26-10-15
Woodfield	Tran.	3,584	S.T.	30-11-15

FRANCE

Name of Ship	Type	Tonnage	How Lost	Date
Bouvet	B.	12,007	M.	18-8-15
Léon Gambetta	A.C.	12,352	S.T.	27-4-15
Amiral Charner	A.C.	4,680	S.T.	8-2-16
Zélée	G.B.	686	G.	28-10-14
Fourche	D.	845	S.T.	26-6-16

Name of Ship	Type	Tonnage	How Lost	Date	Name of Ship	Type	Tonnage	How Lost	Date
Renaudin	D.	756	S.T.	18-9-16	Bremen	F.C.	3,800	S.T.	17-12-15
Dague	D.	720	M.	24-2-15	Leipzig	F.C.	3,200	G.	8-12-14
Fantassin	D.	453	Col.	-6-16	Udine	C.	2,672	S.T.	7-11-15
Branlebas	D.	330	M.	unknown	Frauenlob	C.	2,672	G.	1-6-16
Mousquet	T.B.	298	G.	28-10-14	Ariadne	C.	2,618	G.	28-8-14
No. 347	T.B.	98	Col.	9-10-14	Hela	C.	2,003	S.T.	18-9-14
No. 355	T.B.	97	Col.	9-10-14	Cormoran	G.B.	1,604	Ex. C.	6-11-14
No. 331	T.B.	97	Col.	16-6-15	Geier	G.B.	1,604	I.	8-11-14
No. 219	T.B.	87	G. (†)	-1-15	Eber	G.B.	984	I.	-9-14
No. (†)	T.B.	(†)	Miss.	-1-15	Itis	G.B.	886	Ex. C.	7-11-15
Marlotte	S.	615	G. (†)	26-7-15	Tiger	G.B.	886	Ex. C.	7-11-15
Joule	S.	550	(†)	unknown	Luchs	G.B.	886	Ex. C.	7-11-15
Fremel	S.	550	G.	5-12-15	Jaguar	G.B.	886	Ex. C.	7-11-15
Curie	S.	550	G.	-12-14	Planet	G.B.	640	SK. C.	7-10-14
Monge	S.	550	G.	28-12-15	Moewe	G.B.	640	SK. C.	14-8-14
Calypso	S.	490	Ram.	8-7-15	Tsingtau	G.B.	166	I.	17-8-14
Saphir	S.	450	W.	17-1-15	Vaterland	G.B.	166	I.	17-8-14
Turquoise	S.	450	G.	1-11-15	H. von Wissman	G.B.	300	Cap.	20-8-14
Provence	Aux. C.	18,400	S.T.	26-2-16	(G-196 type)	D.	689	Sk.	26-7-15
Indien	Aux. C.	800	S.T.	8-9-15	V-186	D.	689	G.	unknown
Calvados	Tran.	6,008	S.T.	3-6-15	V-187	D.	689	G.	28-8-14
Casablanca	Min.	945	M.	4-6-15	S-126	D.	477	S.T.	6-10-14

RUSSIA

Name of Ship	Type	Tonnage	How Lost	Date	Name of Ship	Type	Tonnage	How Lost	Date
Imperatritsa Maria	B.D.	22,500	Ex. A	20-10-16	S-116	D.	413	S.T.	6-10-14
Peresviet	B.	12,764	W.	-7-16	S-115	D.	413	G.	17-10-14
Pallada	A.C.	7,775	S.T.	11-10-14	S-106	D.	396	G.	unknown
Jemtechug	F.C.	3,050	T.	28-10-14	S-90	D.	396	W.	20-10-14
Donetz	G.B.	1,200	G.	29-10-14	Taku	D.	276	G.	8-11-14
Kubanetz	G.B.	1,200	G.	28-10-14	Unknown	D.	(†)	SK.	22-8-15
Sivoutch	G.B.	960	G.	16-8-15	Unknown	D.	(†)	SK.	19-8-15
Luit. Pushtchin	D.	326	S.T.	9-8-16	Unknown	D.	(†)	S.T.	14-10-15
Putschino (†)	D.	(†)	G.	80-10-14	Unknown	D.	(†)	(†)	unknown
Prut	Min.	5,600	Sk. C.	29-10-14	5 others	D.	3,500*	G.	1-6-16
Yenesei	Min.	2,926	S.T.	6-6-15	A-2	T.B.	150*	G.	15-1-15
Athos	Min.	1,743	G.	24-12-14	A-6	T.B.	150*	G.	15-1-15
Oleg	Min.	1,125	G.	24-12-14	Unknown	T.B.	(†)	M.	30-6-15
Ryazan	Tran.	3,522	Cap.	6-8-14	Unknown	T.B.	(†)	M.	19-8-15
					Unknown	T.B.	(†)	S.T.	17-12-15
					Unknown	T.B.	(†)	Col.	15-10-15
					8 others	T.B.	1,200	G.	17-8-15
					U-8	S.	255	Ram.	9-8-14
					U-8	S.	280	G.	4-8-15
					U-8 (new)	S.	900	I.	4-11-15
					U-12	S.	295	Ram.	10-8-15
					U-14	S.	500	SK.	8-6-15
					U-15	S.	500	Ram.	9-8-14
					U-18	S.	500	Ram.	23-11-14
					U-27	S.	900	Miss.	10-8-15
					U-29	S.	900	Miss.	26-3-15
					UC-5	S.	200	Cap.	27-4-16
					U-51	S.	900	SK.	17-7-15
					Cap Trafalgar	Aux. C.	18,710	G.	14-9-14
					Berlin	Aux. C.	17,324	I.	16-11-14
					Kronpr. Wilhelm	Aux. C.	14,705	I.	29-4-15
					Kais. W. der Grosse	Aux. C.	13,952	G.	27-8-14
					Pr. Eitel Friedrich	Aux. C.	8,865	I.	7-4-15
					Bethania	Aux. C.	7,548	Cap.	7-9-14
					Pr. Adalbert	Aux. C.	6,030	Cap.	-8-14
					Navarra	Aux. C.	5,794	G.	11-11-14
					Sudmark	Aux. C.	5,113	Cap.	15-8-14
					E. Woerrmann	Aux. C.	4,624	G.	6-1-15
					Max Brock	Aux. C.	4,579	Cap.	9-9-14
					Markomania	Aux. C.	4,505	SK.	16-10-14
					Karnac	Aux. C.	4,437	I.	-11-14
					Macedonia	Aux. C.	4,347	Cap.	30-4-15
					Spreewald	Aux. C.	3,899	Cap.	12-9-14
					Meteor	Aux. C.	3,613	Ex. C.	8-8-15
					Kormoran II	Aux. C.	3,508	I.	15-12-14
					Hermann	Aux. C.	3,000	G.	13-6-16
					Gracia	Aux. C.	2,753	Cap.	10-10-14
					Greif	Aux. C.	(†)	G.	29-2-16
					Patagonia	Aux. C.	(†)	I.	16-11-14
					Unknown	Aux. C.	(†)	SK.	-8-15
					Unknown	Aux. C.	(†)	Cap.	unknown
					Locksun	Ten.	1,020	I.	8-11-14
					Kon. Luise	Min.	2,165	G.	-27-15

ITALY

Name of Ship	Type	Tonnage	How Lost	Date	Name of Ship	Type	Tonnage	How Lost	Date
Leon da Vinci	B.D.	22,840	Ex. A.	-8-16	(1 of Novara type)	F.C.	3,384	T.	13-1-16
Benedetto Brin	B.	13,215	Ex. A.	28-9-15	Kais. Elizabeth	C.	3,937	Ex. C.	7-11-14
Amalfi	A.C.	9,958	S.T.	7-7-16	Zenta	C.	2,264	G.	16-8-14
Gius. Garibaldi	A.C.	7,234	S.T.	18-7-15	Unknown	G.B.	(†)	Sk.	24-5-15
Intrepido	D.	680	M.	17-12-15	Temes	R.Mon.	433	M.	23-10-14
Impetuoso	D.	650	S.T.	10-7-16	Triglav	D.	787	G.	29-12-15
Turbine	D.	325	G.	24-5-15	Lika	D.	787	M.	29-12-15
5-PN	T.B.	118	S.T.	26-6-15	No. 19	T.B.	78	M.	18-8-14
17-OS	T.B.	118	M.	-7-15	Unknown	T.B.	(†)	M.	unknown
Medusa	S.	295	S.T.	17-6-15					
Nereide	S.	315	S.T.	5-8-15					
Giac. Pullino	S.	400	Cap.	-8-16					
Unknown	S.	(†)	A.B.	unknown					
Citta de Messina	Aux. C.	3,495	S.T.	26-7-16					

GERMANY

Name of Ship	Type	Tonnage	How Lost	Date	Name of Ship	Type	Tonnage	How Lost	Date
Pommern	B.	12,997	G.	31-5-16					
Lutnow	B.C.	28,000	G.	1-6-16					
Bluecher	A.C.	15,550	G.	24-1-15					
Scharnhorst	A.C.	11,420	G.	8-12-14					
Gneisenau	A.C.	11,420	G.	8-12-14					
Yorck	A.C.	9,350	M.	8-11-14					
Prinz Adalbert	A.C.	8,858	S.T.	23-10-15					
Friedrich Karl	A.C.	8,858	M.	12-12-14					
Elbing	F.C.	5,440	G.	1-6-16					
Wiesbaden	F.C.	5,000	G.	1-6-16					
Rostock	F.C.	4,822	G.	1-6-16					
Karlsruhe	F.C.	4,822	(†)	-11-14					
Magdeburg	F.C.	4,478	G.	27-8-14					
Mainz	F.C.	4,280	G.	28-8-14					
Koeln	F.C.	4,280	G.	28-8-14					
Augsburg	F.C.	4,280	G.	7-8-14					
Dresden	F.C.	3,592	G.	14-8-15					
Emden	F.C.	3,592	G.	9-11-14					
Nürnberg	F.C.	3,396	G.	8-12-14					
Königsberg	F.C.	3,840	G.	4-7-15					

AUSTRIA

Name of Ship	Type	Tonnage	How Lost	Date
(1 of Novara type)	F.C.	3,384	T.	13-1-16
Kais. Elizabeth	C.	3,937	Ex. C.	7-11-14
Zenta	C.	2,264	G.	16-8-14
Unknown	G.B.	(†)	Sk.	24-5-15
Temes	R.Mon.	433	M.	23-10-14
Triglav	D.	787	G.	29-12-15
Lika	D.	787	M.	29-12-15
No. 19	T.B.	78	M.	18-8-14
Unknown	T.B.	(†)	M.	unknown

\* Estimate.

Name of Ship	Type	Tonnage	How Lost	Date
Unknown	T.B.	(?)	M.	unknown
Unknown	S.	(?)	G.	unknown
U-3	S.	295	G.	13-8-15
U-11	S.	860	A.B.	1-7-15
U-12	S.	550	S.T.	12-8-15
U-18	S.	860	A.B.	1-7-15
Unknown	S.	(?)	(?)	unknown
Unknown	S.	(?)	(?)	unknown
Unknown	Tran.	5,000	SK.	unknown
Unknown	Tran.	3,000	SK.	unknown
Electra	Hosp.	(?)	T.	18-3-16
Beethoven	Tr. Sh.	(?)	M.	17-12-14

TURKEY

Name of Ship	Type	Tonnage	How Lost	Date
Mesudieh	B.	10,000	S.T.	13-12-14
Kheyred-Din				
Barbarossa	B.	9,900	S.T.	9-8-15
Medjidieh	O.	3,432	M.	3-4-15
Yadikar-i-Millet	D.	610	S.T.	-5-15
Yar Hissar	D.	280	S.T.	6-9-15
Demir Hissar	T.B.	96	W.C.	17-4-15
Dhair Hissar	T.B.	96	W.	17-4-15
Pelenk-i-Deria	G.B.	886	T.	28-5-15
(1 of Berk-i-Satvet type)	G.B.	725	M.	29-4-15
Doruk Reis	G.B.	502	SK.	10-12-15
Barak Reis	G.B.	502	SK.	1-11-14
(1 of Doruk Reis type)	G.B.	502	M.	-12-14
Marmaris	G.B.	492	SK.	1-6-15
Rechid Paaha	Tran.	8,000	S.T.	-12-15
Carmen	Tran.	4,424	S.T.	24-10-15
Niagara	Tran.	(?)	S.T.	-5-15
(Three ships)	Tran.	(?)	SK.	unknown
Bazemialen	Tran.	(?)	G.	14-11-14
Bachriachmar	Tran.	(?)	G.	14-11-14
Midhat Pasha	Tran.	(?)	G.	14-11-14

Abbreviations Used in Foregoing Table:

A.B.	Destroyed by bomb from aircraft.
A.C.	Armored cruiser.
Aux. O.	Auxiliary cruiser (armed merchant ship).
B.	Battleships of pre-dreadnought type.
B.O.	Battle cruiser.
B.D.	Battleship, dreadnought type.
B.O.	Battleship of very old type.
C.	(Cruiser (speed less than 23 knots)).
Cap.	Captured.
Col.	Sunk by collision (accidental).
D.	Destroyer.
Ex. A.	Sunk by explosion (accidental).
Ex. O.	Blown up to avoid capture.
F.	Foundered.
F.C.	Fast cruiser (speed over 23 knots).
G.	Destroyed by gun fire.
G.B.	Gunboat.
Hosp.	Hospital ship.
I.	Interned in a neutral port.
M.	Sunk by a mine.
Min.	Mine layer.
Miss.	Missing.
Mon.	Monitor.
Patr.	Patrol boat.
Ram.	Rammed and sunk.
R. Mon.	River monitor.
S.	Submarine.
S.G.	Sunk by gun fire from a submarine.
SK.	Sunk; details unknown.
Sk. O.	Sunk to avoid capture.
S.T.	Sunk by a torpedo from a submarine.
Sup.	Supply vessel.
Surv.	Surveying vessel.
T.	Sunk by a torpedo not fired by a submarine.
T.B.	Torpedo boat.
Tran.	Transport.
Tr. Sh.	Training ship.
W.	Wrecked.
W.C.	Run ashore to avoid capture.

**NAVY.** See BATTLESHIPS AND OTHER WAR VESSELS; NAVAL PROGRESS; SUBMARINES.

**NEBRASKA.** POPULATION. The estimated population of the State on Dec. 31, 1916, was 1,277,750. The population in 1910 was 1,192,214.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by

the United States Department of Agriculture, in 1915-16 were as follows:

	Year	Acreage	Prod. Bu.	Value
Corn	1916	7,400,000	192,400,000	\$150,072,000
	1915	7,100,000	213,000,000	100,110,000
Wheat	1916	3,540,000	68,550,000	109,880,000
	1915	3,876,000	71,018,000	59,855,000
Oats	1916	2,250,000	79,875,000	37,541,000
	1915	2,200,000	70,400,000	21,824,000
Potatoes	1916	105,000	7,665,000	11,498,000
	1915	110,000	11,550,000	4,851,000
Hay	1916	1,850,000	4,070,000	28,397,000
	1915	1,750,000	4,850,000	26,390,000
Rye	1916	192,000	3,072,000	3,564,000
	1915	200,000	3,500,000	2,555,000
Barley	1916	110,000	3,080,000	2,310,000
	1915	105,000	3,255,000	1,867,000

a Tons.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in so far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments	2,500	2,492
Average number of wage earners	24,336	25,144
Capital invested	\$99,901,000	\$121,008,000
Wages	13,948,000	16,898,000
The value of materials used	151,081,000	174,114,000
The value of products	199,019,000	221,616,000

**TRANSPORTATION.** The total single track line operated in the State on June 30, 1916, was 8313 miles. The roads having the longest railway mileage were the Chicago, Burlington, and Quincy, 3601; the Chicago and Northwestern, 1306; and the Northern Pacific, 488.

**EDUCATION.** The children of school age in the State on July, 1915, the latest date for which statistics are available, numbered 387,522. The total enrollment in the public schools was 290,875, with an average daily attendance of 212,049. The total number of teachers was 12,327, of whom 10,749 were females and 1586 males. There was paid to teachers the sum of \$6,217,797. The average monthly salary paid to male teachers was \$72.87, and to female teachers \$57.56. The total expenditure for educational purposes was \$10,121,558.

**FINANCE.** The latest reports of the financial condition of the State are for 1914. The total receipts for the year ending in November were \$6,754,142. The expenditures were \$6,346,043. The balance in the treasury at the end of the year was \$746,108.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions of the State are under the control of the board of commissioners of State institutions. They include the Nebraska Institute for Feeble-Minded Youth at Beatrice, the Girls' Industrial School at Geneva, the Nebraska Soldiers' and Sailors' Home at Burkett, the Asylum for the Insane of Nebraska at Engleside, the State Industrial School at Kearney, the Hospital for Tuberculosis at Kearney, Hospital for the Insane at Lincoln, Orthopedic Hospital at Lincoln, the State Penitentiary at Lincoln, the Nebraska Industrial Home at Milford, the Soldiers' and Sailors' Home at Milford, the Institute for the Blind at Nebraska City, Hospital for the Insane at Norfolk, School for the Deaf at Omaha, Home for Dependent Children at Lincoln.

**POLITICS AND GOVERNMENT.** The presidential year found politics in Nebraska in a plastic condition, so far as party lines are concerned, due to several causes. The division of 1912 in the Republican party had not yet been bridged over, while the Democrats were not united entirely as to policy; although the Democratic party was in power in the State, it was badly split by factional disputes, one of which raged between the followers and the opponents of William Jennings Bryan, and another was occasioned by the impending campaign for State-wide prohibition. An effort to secure the union of the Republicans by placing the name of Charles Evans Hughes on the primary ballot was discouraged by Mr. Hughes, who declined to allow his name formally to go before the voters. However, when the election was held, 16,000 Republicans wrote the name of Hughes on their ballots, and thus showed the strong trend of sentiment in his favor. Albert B. Cummins of Iowa received the Republican preferential vote for president, having a small plurality over Henry Ford; other names voted for were Henry D. Estabrook of New York and Robert G. Ross of Nebraska. The Democrats presented but one name, that of Woodrow Wilson, at the primary as a candidate for president, but the anti-Bryan faction won, denying Mr. Bryan a seat in the St. Louis convention as delegate from his home State. At the Chicago convention the Republican delegates gave their support to Hughes after discharging their obligation to Cummins and Ford. The State tickets nominated were such as to make the final result of the election appear somewhat anomalous. On an initiated petition an amendment to the constitution, providing for State-wide prohibition was submitted to the voters. Both Republican and Democratic parties omitted any reference to prohibition in their platforms, tacitly consenting to the amendment going before the electorate as a nonpartisan issue. However, the Republican candidate for governor had made his primary campaign as an advocate of prohibition, while the successful Democratic candidate was avowedly opposed to prohibition. Charles W. Bryan, brother of William J., had sought nomination from the Democrats as a "dry" candidate for governor, and was decisively defeated. John L. Kennedy of Omaha, who was the Republican candidate for United States Senator against Gilbert M. Hitchcock (Dem.), seeking reelection, was also in favor of prohibition, although he made it no part of his campaign. National issues were brought into the hustings through the tariff, the war, and the railroad strike legislation. Both Mr. Wilson and Mr. Hughes visited the State, Mr. Wilson making a speech at Omaha, and Mr. Hughes spending two full days in the State, winding up his visit at Omaha. Mr. Bryan also made several addresses in the State, but dealt mainly with the issue of prohibition and national issues. The uncertainty of the outcome was increased to some degree by the fact that a large percentage of Nebraska's population is foreign-born or of foreign parentage. The outcome of the voting gave the State to President Wilson by a plurality of 41,056 over Hughes and a majority of 30,943 over all. The total vote of the State was 302,685, the largest in its history by more than 25,000. For president: Wilson, 158,827; Hughes, 117,771; Ben-

son, 7141; Hanly, 2952. The prohibition amendment carried by the following vote: for, 146,574; against, 117,132. Neville, Democrat, for governor ("wet"), was elected over Sutton, Republican ("dry"), by 143,461 to 136,810. Gilbert M. Hitchcock, Democrat, was re-elected to the United States Senate over Kennedy, Republican, by 143,082 to 131,359. Three Republicans and three Democrats were re-elected to the House of Representatives. On the vote for Congressmen, the Republicans have a plurality in the State of 5279. The entire Democratic State ticket was elected, and the Democrats control in both branches of the Legislature.

**STATE OFFICERS.** Governor, Keith Neville; Lieutenant-Governor, Edgar Howard; Secretary of State, C. W. Pool; Treasurer, G. E. Hall; Auditor, W. H. Smith; Attorney-General, W. E. Reed; Superintendent of Education, W. H. Clemmons—all Democrats.

**JUDICIARY.** Supreme Court: Chief Justice, A. M. Morrissey; Justices, Charles B. Letton, Francis G. Hamer, William B. Rose, Samuel H. Sedgwick, James R. Dean, Albert J. Cornish; Clerk, H. C. Lindsay.

**STATE LEGISLATURE:**

	Senate	House	Joint Ballot
Democrats .....	22	62	84
Republicans .....	11	38	49
Democratic majority..	11	24	35

**NEBRASKA, UNIVERSITY OF.** A State educational institution at Lincoln, Neb., founded in 1869. In all departments in the fall of 1916 there were 4737 students. The teaching staff numbered 328. W. W. Burr was appointed professor of agronomy. The permanent endowment fund, as accumulated to November 30th, amounted to \$815,277. For the preceding year the total available resources for all purposes amounted to \$1,736,208. The library contained 130,632 volumes. Chancellor, Samuel Avery. See also **HORTICULTURE**.

**NECROLOGY.** The following list contains the names of notable persons who died in 1916. An asterisk before a name indicates that it will be found in its proper alphabetical place in the **YEAR BOOK** as the title of a separate article.

- \* Abbe, Cleveland.
- \* Achurch, Janet.
- Adams, Annie. See Kiskadden, Annie Adams.
- \* Aleichem, Scholem.
- Alexander, Béla. Hungarian radiologist, director of the radiologic institute of the Budapest Royal Hungarian University; noted for Röntgen ray researches and as author of a book on this subject that was translated into several languages. Died at Budapest, February 10; born, 1857.
- \* Angell, James Burrill.
- Arbuthnot, Sir Robert Keith, fourth Bart. British rear admiral, commanding first cruiser squadron in 1916. Killed in action off Jutland, May 31.
- \* Archbold, John Dustin.
- \* Arnoldson, Klas Pontus.
- Ashby, Thomas Almond. American gynecologist, professor in the University of Maryland and in the Woman's Medical College, Baltimore; gynecologist to the Maryland General Hospital; former president of the Medical and Chirurgical Faculty of Maryland; member of the State House of Delegates in 1910; and author of books on the Civil War. Died in Baltimore, June 26; born, 1848.
- \* Ashley, Clarence D.
- Aubé, Jean Paul. French sculptor, many of whose works, principally classical and portrait subjects, are in public places in Paris; professor in the Académie

- des Beaux-Arts. Died at Capbreton (Landes), August 23; born, 1837.
- Aubrey, William Hickman Smith. British journalist, author, and lecturer. Died at Croydon, February 10; born, 1858.
- Augusta Caroline. Dowager Grand Duchess of Mecklenburg-Strelitz, a Princess of Great Britain, Ireland, and Hanover and the last surviving grandchild of George III of England. Her death at Neustrelitz was announced December 5. She was born in 1821.
- Babcock, Charles Henry. American Protestant Episcopal clergyman, a former president of the Church Congress. Died in New York City, January 6; born, 1845.
- \* Babcock, Stephen.
- \* Baccelli, Guido.
- Backlund (Johan), Oskar. Swedish astronomer of Russian residence, director of the Pulkova Observatory. Died August 29; born, 1846. See ASTRONOMY.
- \* Bacon, Edwin M.
- Baker, Lady Florence. Widow of the British explorer, Sir Samuel White Baker, whom she accompanied on important African expeditions. Died at Newton Abbot, England, March 11; born, 1842.
- Ball, Sir Charles Bent, Bart. Irish surgeon, honorary surgeon to the King in Ireland and Regius professor of surgery at Dublin University. Died in Dublin, March 17; born, 1851.
- \* Ballet, Gilbert.
- \* Barker, Albert Smith.
- Barrows, Charles Clifford. American surgeon, professor of gynecology at Cornell University Medical College. died in New York, January 2; born, 1857.
- Bartlett, Samuel. Canadian ice navigator, noted for his experience and skill; commander at different times of the *Diana*, the *Windward*, the *Erk*, and the *Jeanie*; in 1903-04 master of the *Neptune*, in A. P. Lowe's expedition to Hudson Bay and the Arctic archipelago. Died at Brigus, Newfoundland, September 9.
- Barton, Enos M. American electrical engineer, president and later chairman of the board of directors of the Western Electric Company, died at Biloxi, Miss., May 3; born, 1842.
- Bassett, Austin Bradley. American Congregational minister, and later a professor in and secretary of Hartford Theological Seminary. Died in Hartford, Conn., October 5; born, 1859.
- Battisti, Cesare. Italian author and editor, leader of Italian irredentism in the Trentino; editor of *Tridentum* of Trent. Wounded, captured at Vallarsa, and hanged by the Austrians July 16. Born 1875.
- Baxter, Walter. British navigator, commodore of the Anchor Line fleet. Died in Glasgow, June 17; born, 1849.
- \* Bean, Tarleton Hoffman.
- \* Beck, Edward Anthony.
- Beecham, Sir Joseph, Bart. British pill manufacturer, famous for his sensational advertising, who became the third-richest man in England, with a fortune of \$140,000,000. Died in Hampstead, October 28; born, 1848.
- \* Begas, Karl.
- Benini, Ferruccio. One of the greatest of Italian actors, especially renowned as an interpreter of Goldoni and Giacinto Gallina. Died in 1916; born, 1854.
- Beothy, Paul. Hungarian statesman, president of the Hungarian Diet; former Minister of Commerce. Died in Budapest, October 6.
- Berlepech, Goswina von. Austrian writer, known especially for novels set in Switzerland, where they have been very popular. Among the titles are: *Mutter, Mann und Weib*, *Heimat*, and *Jakobe*. Died in Vienna, April 9; born, 1845.
- Birkbeck, William John. British scholar and traveler, student of Russian ecclesiastical and political affairs, known for important translations of Russian and other Slavonic religious works. Died June 9; born, 1859.
- Bishop, Emily Montague. American health culturist, writer, and suffrage pioneer, widow of Coleman Bishop (once editor of *Judge*). Died in New York City, November 22; born, 1858.
- \* Blake, Lucien Ira.
- Blanchard, James Armstrong. American jurist, associate justice of the Supreme Court of New York from 1899 to 1915. Died in New York City, July 9; born, 1845.
- Blessing, Henrik Greve. Norwegian scientist and explorer, physician and botanist of the Nansen Polar Expedition in 1893-96. His death in Christiania was announced May 22.
- Blind, Rudolf. British religious painter. Died in London, February 3; born, 1850 (in Brussels).
- \* Bias, Daniel.
- \* Blow, Susan Elizabeth.
- Blue, Leonard A. American educator, dean of the New York State College of Teachers. Died in Albany, N. Y., August 18; born, 1869.
- Blumenschein, William Leonard. American organist and composer, from 1891 to 1896 chorus-master of the Cincinnati May Festival. Died at Dayton, Ohio, March 27; born, 1849.
- \* Bogue, Virgil Gay.
- \* Boissevain, Inez Millholland.
- \* Boldt, George C.
- \* Bolton, Sarah Knowles.
- Bolzani, Ugo. Italian historian and medievalist. Died February 27; born, 1847.
- \* Booth, Charles.
- Boucaut, Sir James Penn. Australian statesman, who had been premier of South Australia, deputy governor, and Supreme Court judge. Died in Adelaide, February 1; born, 1831.
- Boucicault, Mrs. Dion. See Robertson, Agnes.
- Bowen, Marcellus. American missionary, representative of the American Bible Society in Constantinople since 1888. Died in Geneva, Switzerland, October 3; born, 1846.
- Bowker, William Henry. American agricultural expert, a pioneer in the fertilizer industry (president Bowker Fertilizer Co.), and trustee of the Massachusetts Agricultural College. Died in Boston, January 5; born, 1851.
- Bowring, Sir William. British shipowner, and in 1893-94 Lord Mayor of Liverpool; created a baronet in 1907. Died in Liverpool, October 21; born, 1837.
- Boyd, Sir John Alexander. Canadian jurist, since 1881 chancellor of the Province of Ontario. Died in Toronto, November 23; born, 1837.
- \* Braun, Lily.
- \* Braun, Ludwig.
- Brewer, Leigh Richmond. American Protestant Episcopal clergyman since 1880 missionary bishop of Montana. Died at Helena, Mont., August 28; born, 1839.
- Brickner, Samuel Max. American gynecologist and editor of the *Medical Pickwick*. Died at Saranac Lake, N. Y., May 5; born, 1867.
- \* Brooke, Stopford Augustus.
- Brooks, Joseph. American theatrical manager. Died in New York City, November 27; born, 1849.
- \* Brown, Francis.
- Brown, Robert Burns. American soldier and journalist, past commander in chief of the Grand Army of the Republic and editor of the *Zanesville Courier*. Died in Zanesville, Ohio, July 30; born, 1844.
- Brown, Thomas Wistar. American Quaker business man, financier, and philanthropist, generous benefactor of Haverford College (of whose board of managers he was president for 25 years) and of the Pennsylvania Hospital, to which he gave \$600,000.
- \* Brownlow, Sir Charles.
- Bruns, Ludwig. German physician, professor of neurology in the University of Hanover and chief surgeon of the Hospital for Children's Diseases in that city; author of important contributions in his field. Died November 12; born, 1858.
- \* Brunton, Sir (Thomas) Lauder.
- Bugatti, Rembrandt. Italian animal sculptor. Died in Paris, January 9; born, 1885.
- Bunce, William Gedney. American landscape painter, member of the National Academy of Design and of the National Institute of Arts and Letters. Died in Hartford, Conn., November 5; born, 1840. He studied under Achenbach in Munich and P. J. Clays in Antwerp. Medals were awarded him at Paris, Charleston, and St. Louis. His "Morning View in Venice," "Early Morning—Venice," and "Studio of F. D. Millet," are in the Metropolitan Museum, New York; "Sunset, San Giorgio, Venice," in the National Gallery, Washington, and "On the Lagoon," in the Rhode Island School of Design.
- \* Burleigh, Edwin Chick.
- \* Burnett, Henry Lawrence.
- \* Burnham, Edward Levy-Lawson, first Baron.
- \* Burrill, Thomas Jonathan.
- \* Burroughs, Edith Woodman.
- Bustanoby, Andre. American restaurateur. Died in New York City, February 10; born, 1872 (in Pau, France.)
- \* Cabrera & Ibars, Juan Bautistas.
- Caird, Sir James Key, first Bart. British manufacturer and philanthropist, who had given away a total of about \$1,250,000, and was chief backer of the Shackleton Antarctic expedition. Died at Belmont Castle, Perthshire, March 9; born, 1837.
- \* Calhoun, William James.
- Canning, Albert Stratford George. British author of books on history, philosophy, religion, and literary criticism. Died at Rostrevor, County Down, Ireland, April 22; born, 1832.
- \* Cannon, James Graham.
- Cardenas, Adam. Nicaraguan statesman, President of Nicaragua from 1882 to 1886, leader of the Conservative party, and president of the Congress in 1911. Died at San Juan del Sur, July 13.
- Carmen Sylva. See Elizabeth, Dowager Queen of Rumania.
- \* Carpenter, Louis Henry.
- Carr, Frank Osmond. English composer of many light



operas, some very successful. Died at Uxbridge, England, August 29; born, 1858.

Carr, J. W. Comyns. British editor, art critic, and dramatist. Died in London. December 18; born, 1849.

Carter, Thomas Coke. American clergyman, Bishop of the United Brethren Church, resident in Chattanooga, Tenn. Died in Cincinnati, Ohio, February 27; born, 1851.

\* Cassius, Joaquin D.

\* Casement, Sir Roger David.

Casgrain, Thomas Chase. Canadian lawyer and cabinet member, attorney-general of Canada in 1892-96 and since 1915. Died at Ottawa, December 29; born, 1852.

\* Catlin, Isaac Swartwood.

\* Chamberlain, Samuel Selwyn.

Chapman, Victor Emmanuel. American aviator and soldier, son of John Jay Chapman; student in the Ecole des Beaux-Arts, Paris, at the outbreak of the European war. Sergeant in the Franco-American flying corps, the first American aviator killed in the war. After making a brilliant record, he was shot dead over the German lines before Verdun, June 23.

\* Charmes, Francis.

Charrington, Janet Achurch. See Achurch.

\* Chase, William Merritt.

Chauveau, Charles Alexandre. Canadian lawyer and banker, former solicitor-general of the Province of Quebec and professor of criminal law in Laval University for 15 years. Died in New York City, March 7; born, 1847.

\* Cheney, Charles Edward.

Chivacci, Vincenz. Austrian editor. Died in Vienna in 1916; born, 1847. See GERMAN LITERATURE, *Necrology*.

Clam, du Paty de. French army officer, a colonel, who figured prominently in the Dreyfus case. Died of wounds, September 4.

\* Clanricarde, Hubert, second Marquis.

\* Clarke, James P.

\* Clementi-Smith, Sir Cecil.

Clough, William Pitt. American railroad man, chairman of the board of directors of the Northern Pacific Railway. Died in New York City, August 17; born, 1844.

Cohan, Josephine. See Niblo.

Colby, Mrs. Clara Bewick. American pioneer suffragist, founder and for 25 years editor of *The Woman's Tribune*, a reform paper. She was among the first women to take a degree at the University of Wisconsin, where she afterward taught Latin. Died in Palo Alto, Cal., September 7.

Colin, Paul. French landscape painter; also designer of several important tapestries executed by the Gobelins. Died in Paris June 18; born, 1838.

Collin, L. J. Raphael. French figure and portrait painter, known best for decorations in the Sorbonne and for the ceilings of the Odéon and the Opéra Comique, Paris. Died in Brionne (Eure), Oct. 21; born, 1850.

\* Colton, George Radcliffe.

Concas y Palau, Victor María. Spanish vice admiral and statesman; commander of the Spanish cruiser *Infanta María Theresa* in the Battle of Santiago de Cuba; Minister of Marine in 1905; arbitrator of land claims against the United States made by residents of Panama, and was to have completed this service in 1917. Death announced from Madrid September 26; born, 1845.

\* Connolly, James.

Cook, Albert John. American naturalist, State commissioner of horticulture of California from 1911. Died in Owasso, Mich., September 29; born, 1842.

\* Cook, Francis Augustus.

Cook, Henry Clav. American soldier, veteran of the Civil War and Indian fighter, brigadier-general retired, U. S. A. Died at Fall River, Mass., February 22; born, 1837.

\* Cook, Walter.

Cooley, LeRoy Clark. American physicist, professor of physics in Vassar College from 1894 to 1907. Died in Poughkeepsie, N. Y., September 20; born, 1833.

Cooper, Charles Alfred. British journalist, for 80 years before 1906 editor of the Edinburgh *Scotman*. Died April 14; born, 1829.

Coppet, Edward J. de. See De Coppet.

Corbett, Elizabeth Wiley. American physician, the pioneer among women doctors in California, and the sister of Harvey W. Wiley. Died in Washington, D. C., June 4; born, 1834.

Cornish, Francis Warre. English educator and author, vice-provost of Eton College and formerly fellow of King's College, Cambridge; author of *A Life of Oliver Cromwell* and of other books and numerous articles. Died August 28; born, 1839.

\* Corthell, Elmer Lawrence.

Coues, Samuel Franklin. American naval officer, retired as a rear admiral, surgeon in the Civil War and later medical director. Died in Cambridge, Mass., May 1; born, 1825.

\* Cox, George Barnesdale.

Coxe, Eckley B., Jr. American philanthropist, financial backer of University of Pennsylvania expeditions to Egypt which made important discoveries. Died at Drifton, Pa., September 20; born, 1873.

Craig, William Bayard. American clergyman and educator, formerly chancellor of Drake University, at Des Moines, Iowa. Died at San Bernardino, Cal., September 15; born, 1846.

Curwen, John Spencer. English musical educator, son of the founder and himself an active promoter of the Tonic Sol-fa System; president from 1880 of the Tonic Sol-fa College. Died in London, August 6; born, 1847.

\* Cushing, Ernest Watson.

Czerny, Vincenz. German surgeon, of Austrian birth, from 1877 professor of surgery at Heidelberg, from 1906 also director of the Institute for Cancer Experimentation, and honorary president of the International Cancer Investigation Association. Died in Heidelberg, October 4; born, 1842.

Daly, Joseph Francis. American jurist, chief justice of the Court of Common Pleas, New York (1890-96) and justice of the Supreme Court of New York (1896-98); president of the Catholic Club in 1894-99 and vice-president of The Players; brother of the late Augustin Daly. Died August 6; born, 1840.

Damove, Pierre Emmanuel. French painter of landscapes, follower of Corot and Daubigny. Died in Paris, January 22; born, 1847.

\* Danby, Frank.

Darío, Rubén. Nicaraguan poet, considered the greatest of Spanish-American poets and the greatest recent poet in the Spanish language; author of *Prosas profanas* and of *Cantos de vida y esperanza* (i.e., Songs of Life and Hope), Eng. trans., New York, 1916. Died in February; born, 1867.

Davenport, Mary. American actress, active for many years. She played "Juliet" to the "Romeo" of Edwin Booth, and supported other famous actors. Miss Davenport, or Mrs. J. Duke Murray, as she was in private life, was a charter member of the Professional Women's League. She retired some years ago. Died in Fresno, Cal., June 26; born, 1851.

Davidson, James Leigh Strachan. See Strachan-Davidson.

Davies, Acton. American dramatic critic, for 20 years reviewer for the New York *Evening Sun*; died in Chicago, Ill., June 12; born, 1870.

Davis, Charles Albert. American geologist, geologist on the United States Geological Survey since 1914, editor of the *Journal of the American Peat Society* since 1907, and writer on geology. Died in Washington, D. C., April 9; born, 1861.

\* Davis, Horace.

\* Davis, Richard Harding.

Dawson, Jackson Thornton. American horticulturist, superintendent of the Arnold Arboretum of Harvard University. Died in Jamaica Plain, Mass., August 3; born, 1841.

Deckert, Emil. German geographer, professor in the new university of Frankfurt; author of a book *Nord Amerika*, showing the fruits of long study and much travel in the United States. Died at Frankfort, October 5.

\* De Coppet, Edward J.

\* Dedekind, J. Wilhelm Richard.

Dejob, Charles. French scholar, professor of the languages and literatures of Southern Europe in the University of Paris, associate editor of the *Bulletin Italien*, and author of numerous works, particularly on the literature of Italy. Died April 5; born, 1847.

Delafosse, Jules. French politician and writer on political subjects for journals; also author of books; several times a member of the Chamber of Deputies; known as an orator. Died in Paris, February 1; born, 1843.

Delbos, Victor. French philosopher, a writer on Spinoza, Schelling, Kant, Rousseau, and others. Died in Paris, June 16; born, 1862. See PHILOSOPHY.

Della Volpe, Francis. Cardinal. See Volpe.

Delmotte, Nicholas Victor. French soldier, who was general in command of a brigade during the retreat from Charleroi, in the European war in Paris. Died February 7 of illness contracted at the front.

De Ségur, Marquis Pierre. See Ségur.

De Thebes, Madame. See Thebes, Madame de.

De Vogüé, Charles Jean Melchior, Marquis. See Vogue.

\* Dieulafoy, Jeanne.

Digby, Sir Kenelm Edward. British law scholar and public official. Died at Studand, Dorsetshire, April 21; born, 1836.

\* Dodd, Frank Howard.

\* Dodge, Grenville Mellen.

Donnersmarck, Prince Henckel von. German industrial and financial leader, an adviser of Prince Bismarck, reputed to have amassed a fortune of more than \$65,000,000. His death in Berlin was announced December 19. He was born in 1829.

Douglas, David. Scottish publisher, who virtually in-

roduced James, Howells, and other important American novelists to the British public; for several years editor of the *North British Review*. Died in Edinburgh, April 5; born, 1823.

\* Doyen, Eugène Louis.

\* Drake, Alexander Wilson.

Duke, Basil Wilson. American soldier and lawyer, who fought in the Confederate Army in the Civil War under his brother-in-law, General Morgan, of Morgan's Raids' fame, and became brigadier-general. Later he practiced law in Louisville, Ky. Died in New York City, September 16; born, 1838.

\* Duncan, Louis.

\* Duncan, Norman.

Duncker, Dora. German author, especially of novels. Died October 11; born, 1855.

Duquet, Alfred. French writer on historical and military subjects, known especially for a series of books comprising a complete history of the Franco-Prussian War. Died in Paris, May 19; born, 1842.

Duryea, Herman B. American horse breeder and racer, and yachtsman. Died at Saranac Lake, N. Y., January 25; born, 1868.

\* Dwight, Timothy.

\* Eakins, Thomas.

Eaton, Seymour. American author and journalist, founder of the *Tabard Inn* and *Booklovers' Libraries*; originator of the "Teddy Bear." Died in Philadelphia, March 13; born, 1859.

\* Ebner-Eschenbach, Marie, Baroness von.

\* Echegaray, José.

\* Elizabeth, Dowager Queen of Rumania.

\* Ellis, Edith M. O. (Mrs. Havelock Ellis.)

\* Ellis, Edward Sylvester.

Elsner, Henry Leopold. American physician, professor of medicine at Syracuse University and former president of the Medical Society of the State of New York. Died in Washington, D. C., February 17; born, 1855.

Emmott, George Henry. British law scholar and educator, dean of the Law Faculty of the University of Liverpool. Died in Liverpool, March 11; born, 1855.

Ennaking, John Joseph. American landscape painter. Died in Boston, November 17; born, 1839.

Erdmannsdörfer-Fichtner, Pauline von. Distinguished German pianist; pupil of Liszt; court pianist to the Duke of Saxe-Weimar and Hesse-Darmstadt. Died in Munich, September 24; born, 1847.

Esson, William. British mathematician, Savilian professor of geometry and estates bursar of Merton College, Oxford. Died at Oxford, August 25; born, 1838.

\* Faguet, Emile.

Falke, Gustav. German poet. Died in Hamburg in January; born, 1858. See GERMAN LITERATURE, *Necrology*.

Farmer, Sarah J. American religious leader, founder of a colony at Greenacre, Maine, noted for free discussion of religious questions. Died at Elliot, Maine, November 22; born, 1846.

Favill, Henry Baird. American physician, professor of medicine in the Chicago polyclinic and of therapeutics and later clinical medicine in Rush Medical College, also chairman of the Council on Health and Public Instruction of the American Medical Association. Died in Springfield, Mass., February 20; born, 1860.

\* Ferguson, Samuel David.

Fernández de Béthencourt, Francisco. See SPANISH LITERATURE.

Filipescu, Nicola. Rumanian statesman, senator, ex-minister of war, and leader of the Unionist federation, who had urged Rumania to join the Entente Allies in the European War. Died at Bucharest, October 13; born, 1857.

Filon, Augustin. French littérateur. When tutor to the son of Napoleon III, he had been exiled with the Bonapartists in 1870, and had since lived chiefly in England. His *Histoire de la littérature anglaise* was crowned by the French Academy. He contributed to French reviews articles on notable Englishmen and to the *Fortnightly* and other British journals articles on distinguished Frenchmen. Died at Croydon, England, May 13; born, 1841.

\* Finney, Frederick Norton.

Finochiaro-Aprile, Camillo. Sicilian jurist, statesman, and educator, one of the leading figures in modern Italy's internal development. Died in 1916; born, 1851.

\* Fiske, Stephen.

\* Flag, Charles Noél.

Florence, Henry Louis. British architect, Soane medalist and vice-president of the Royal Institute of British Architects and gold medalist of the Royal Academy; known chiefly for buildings in London. Died in Bath, February 20; born, 1848.

Fox, Charles Eben. American naval officer, rear admiral in command of the Charleston navy yard when retired in 1911. Died in Washington, D. C., February 12; born, 1851.

Foy, James Joseph. Canadian public official, in 1911 premier of Ontario. Died in Toronto, June 12; born, 1847.

Francis, Joseph. American Indian, former governor of the Penobscot tribe, and its representative to the Maine legislature. His death on Indian Island, Oldtown, Maine, was announced July 21. He was born in 1846.

\* Francis Joseph.

Frankau, Mrs. Julia. See Danby, Frank.

Frug, Semyen Grigoryevitch. Russian Jewish poet, who wrote in Russian, Yiddish, and Hebrew, and was known by the expression he gave to the sorrows of his people. Died in Odessa, Russia, September 20; born, 1860.

\* Gallieni, Joseph Simon.

\* Gally, Merritt.

Gardner, William A. American railroad president, head of Chicago and Northwestern since 1910. Died at Wianno Beach, Mass., May 11; born, 1859.

\* Garnett, James Mercer.

Gemünder, Rudolf F. Son of August Gemünder, famous German violin maker; a partner in the firm of August Gemünder and Sons. Died in Leonia, N. J., July 8; born 1850.

\* George, Henry, Jr.

\* Gernsheim, Friedrich.

Gilchrist, William Wallace. American organist and composer, resident in Philadelphia; composer of two symphonies, chamber music and church music. Died in Easton, Pa., December 20; born, 1846.

\* Gilder, Jeanette Leonard.

Gilhooly, James Peter. Irish Nationalist, member of parliament since 1885, prominent in Irish organizations. Died in Cork, October 16; born, 1847.

Gilmour, George. American authority on accident prevention and industrial safety. Died in Brooklyn, N. Y., June 15; born, 1865.

Girodon, Pierre. French soldier, who had risen from colonel to general since the beginning of the European war, and made a brilliant record. Killed in action on the Somme front, September 23.

Glendinning, John. English actor, who played in the United States with Mr. and Mrs. Kendall, Clara Morris, Olga Nethersole, and Nance O'Neil; in 1895 created the rôle of the Laird in *Trilby*. Died at Cheltenham, Eng., July 17; born, 1857.

\* Goltz, Kolmar, Baron von der.

\* Gomme, Sir (George) Laurence.

\* Görgey, Arthur.

\* Gorst, Sir John Eldon.

Gorton, David Allyn. American physician, founder of the Eugenic Society of America. Died in Brooklyn, N. Y., February 22; born, 1833.

\* Gotti, Girolamo Maria.

\* Gower, Lord Ronald Sutherland.

Graham, William Montrose. American soldier, four times brevetted for services in the Civil War; commander of the departments of Texas and the Gulf; major-general of volunteers, commanding the Second Army Corps in the Spanish war; major-general, U. S. A., retired. Died at Annapolis, January 17; born, 1834.

\* Granados, Enrique.

\* Green, Hetty Howland Robinson.

Grinnell, Charles Edward. American lawyer, master in chancery at Boston for many years, twice editor of the *American Law Review*, author of legal and semi-legal works. Died in Boston, February 2; born, 1841.

\* Grosvenor, William Mercer.

Hackett, Sir John Winthrop. Australian statesman, formerly delegate from West Australia to the National Australasian Federal Convention and chancellor of the State University. Died in Perth, Western Australia, February 19; born, 1848.

Hamilton, "Tody" (Richard F.). American press agent, famous for his connection with the Barnum and Bailey Circus and the advertisements that he wrote for it. Died in Baltimore, Md., August 16; born, 1847.

Hammershøj, Vilhelm. Danish artist. His death was reported from Copenhagen, February 13; born, 1864.

Hansjakob, Heinrich. German clergyman, resident in Freiburg-im-Breisgau; author of historical, philosophical, religious, and other works. Died, 1916; born, 1837.

\* Hardie, William Ross.

Harkness, Charles William. American capitalist, one of the largest holders of Standard Oil stock. Died in New York City May 1; born, 1860.

\* Harpignies, Henri Joseph.

\* Harris, Norman Wait.

Harris, William, Sr. American theatrical producer, dean of his profession. Died at Bayside, Long Island, November 25; born, 1845.

\* Hart, James Morgan.

\* Hay, Lord John.

\* Hayes, Charles Willard.

Heckel, Edouard Marie. French naturalist, founder of the Colonial Museum at Marseilles. Died at Marseilles, January 20; born, 1848.

\* Hedeman, Jules.

Heinrich, Max. German concert baritone and composer of songs; one of the first to introduce the German Lied in the United States. Died in New York City, August 9; born, 1853.

Hensman, Howard. British newspaper correspondent in India, friend of Lord Roberts, and historian of the Afghan War. Died at Simla, India, June 12.

\* Hepburn, William Peters.

\* Herbermann, Charles George.

\* Hees, Richard.

Hicks-Beach, Sir Michael Edward. See St. Aldwyn.

Michael E. Hicks-Beach, first Earl.

Higgins, A. Foster. American banker, former president of the Knickerbocker Trust Company, which he rehabilitated, and reorganizer of the United States Lloyds. Died in Greenwich, Conn., November 28; born, 1821.

\* Hilgard, Eugene Woldemar.

\* Hill, James Jerome.

\* Hill, John Alexander.

Hirschsprung, Harald H. Danish surgeon, since 1870 chief surgeon of the Children's Hospital at Copenhagen and formerly privat-docent of pediatrics at the University of Copenhagen. Died in April or May, 1916; born, 1830.

Hirth, Georg. German editor and author, known chiefly as founder (in 1896) and editor of *Jugend*. Died in Munich, March 29; born, 1841.

Hirschsprung, H.

Hofheims, Rudolph H. American dentist, emeritus professor in the University of Buffalo, and chosen as principal of a new School for Dental Hygienists in Rochester, N. Y. Died in Rochester, November 23; born, 1856.

Holmes, Hugh. British jurist, lord justice of appeal in Ireland from 1897 to 1914. Died in Dublin, April 19; born, 1840.

Hopkins, Sir John Ommanney. British admiral, commander in chief of different stations and connected with the navy for 40 years. Died at Highcliffe, Hampshire, July 30; born, 1824.

Hopper, Charles H. American actor, best known for his rôle of "Chimmie Fadden." Died at Ashtabula, Ohio, June 17; born, 1863.

\* Horsley, Sir Victor Alexander Haden.

Howell, Phillip. British general, who had had a brilliant career in India and in the European war, and at 39 had gained high rank. It was announced October 11 that he had been killed in action.

\* Howison, George Holmes.

Huang-hsing. Chinese general, organizer of the revolution of 1911, premier of the provisional government, commander of the first army of the Chinese Republic. Died, October 31; born, 1875.

\* Huerta, Victoriano.

Humphreys, A. S. American jurist, judge of the Circuit Court in Honolulu, H. I., and reformer of the Hawaiian legal code. Died in Honolulu, August 20.

Hyde, James Trevelyan. Secretary of the National Horse Show Association, which he was influential in organizing in 1882. Died in New York City, May 1; born, 1856.

Inaquet, Alfred Joseph. French chemist and politician, through whose efforts while a deputy divorce was reestablished in France in 1884. His death was reported from Paris, November 11; born, 1834.

Irrgang, Bernhard. German organ virtuoso and composer of fine organ music. Died in Berlin, April 8; born, 1869.

Iszoddin, Yusuf. See Yusuf Iszoddin.

\* Jackson, George Thomas.

\* Jacobs, Joseph.

Jaluzot, Jules. French politician, journalist, and business man. Died at Corvol l'Orguilleux (Nièvre), February 22; born, 1834.

\* James, Henry.

\* James, Thomas Lemuel.

Jamieson, William Allan. Scottish dermatologist, president of the Royal College of Physicians at Edinburgh in 1909-10. Died in Edinburgh, April 21; born, 1829.

Jane, Fred T. British naval author and journalist. Died at Southsea, England, March 8; born, 1870.

John, John Price Durbin. American educator and lecturer, president of De Pauw University from 1889 to 1895. Died at Greencastle, Ind., August 7; born, 1843.

\* Jones, Harry Clary.

\* Jordan, Eben Dyer.

Judd, John Wesley. British geologist and educator, formerly professor and dean in Royal College of Science, London; author of books and papers. Died in London, March 3; born, 1840.

Judson, Adoniram Brown. American surgeon, son of Adoniram Judson, the famous missionary; surgeon in the Civil War; later in practice in New York; president of the American Orthopedic Association in 1891. Died in New York, September 20; born, 1837.

Jungfleisch, Emile-Clément. French chemist, member of the Academy of Medicine and the Academy of Sciences,

whose researches were valuable to industrial chemistry. Died in Paris April 25; born, 1839.

\* Kamimura, Hikonojo.

\* Karl, Tom.

Kastle, Joseph Hoeing. American chemist and agriculturist, director of the Kentucky Agricultural Experiment Station and dean of the College of Agriculture of the State University, Lexington, Ky., from 1912. Died in Lexington, September 24; born, 1864.

\* Kellogg, Clara Louise.

Kelly, Allen. American newspaper man. Died in Los Angeles, Cal., May 16; born, 1855.

Kennedy, Sir William Robert. British admiral, who received medals in the Crimea and China; also an author. Died in Coventry, England, October 9; born, 1838.

\* Kerens, Richard O.

King, David H., Jr. American constructor, builder of Madison Square Garden, the Washington Arch, and various New York buildings, died in New York, April 20; born, 1850.

\* King, William Frederick.

Kingman, Daniel C. American soldier and engineer, former chief of engineers of the United States army, who had charge of improvements in the Yellowstone National Park in 1883-87. Died at Atlantic City, N. J., November 14; born, 1852.

Kinsley, William J. American handwriting expert, who testified in many famous cases. Died in New York City, March 25; born, 1865.

Kirchhoff, Charles William Henry.

Kiskadden, Annie Adams. American actress, mother of Maude Adams; in 1890 a member of Charles Frohman's Company with her daughter; she retired in 1908. In 1869 she married James H. Kiskadden. Died at Salt Lake City, Utah, March 17; born, 1848.

\* Kitchener of Khartoum, Horatio Herbert, first Earl. Kitchener, Hermann. German anthropologist, associate professor of anatomy and physical anthropology at Breslau from 1907; visited Australia and Java in 1904-07; prominent in the discussion of evolutionary problems relating to the position of man, one of his most original conceptions being that the human species was not directly related to the anthropoids but had developed from relatively inferior primate types. Died January 5; born, 1863.

Klindworth, Karl. German pianist and teacher; founder of the Klindworth-Scharwenka Conservatory in Berlin; made masterly pianoforte arrangements of Wagner's music dramas; retired to Potsdam in 1893. Died in Stolpe, near Berlin, in July; born, 1830.

\* Knight, William Angus.

Knorr, Ivan. German composer, teacher, and writer, from 1883 to 1908 professor of theory at the Hoch Conservatory in Frankfurt; composer of three operas, orchestral and chamber music; author of many theoretical works. Died in Frankfurt-on-Main, January 22; born, 1853.

Knox, Edward M. American hat manufacturer, a soldier in the Civil War, who received a Congressional medal for bravery at Gettysburg. Died in New York City, March 28; born, 1842.

Koettlitz, Reginald. British physician and explorer, member of the Jackson-Harmaworth expedition to Frans Josef Land, of the Blundell expedition in Somaliland and Abyssinia, and, as chief surgeon and botanist, of Scott's antarctic expedition in 1901-04. Died in South Africa, January 15; born, 1861.

Krüger, Friedrich J. O. Danish astronomer, director of the astronomical observatory at Aarhus, Denmark. Died January 6; born, 1864. See ASTRONOMY.

\* Kulpe, Oswald.

Kyle, D(avid) Braden. American physician, professor of laryngology and rhinology in Jefferson Medical College, Philadelphia, from 1896; on staffs of various hospitals; president American Laryngological Association in 1910; author of a standard work on *Diseases of the Nose and Throat* (5 editions). Died in Philadelphia, October 23; born, 1863.

\* Labbé, Léon.

Lacy, Ernest. American scholar and playwright, for many years professor of English in the Central High School, Philadelphia, Pa. Died at Philadelphia, June 17; born, 1863.

\* Lamar, Joseph Rucker.

Landry, Sir Pierre A. Canadian jurist, chief justice of the Supreme Court, King's Bench Division, of New Brunswick, died in Portchester, N. B., July 28; born, 1846.

Largeau, Victor. French general, who had an important part in the expansion of French interests in Africa; from October, 1915, in command of a brigade of infantry near Verdun. Died March 27, in the Verdun region, from wounds received in battle; born, 1867.

\* Laurence, Sir George.

Lavignac, Albert. Eminent French musical scholar; from 1882 till his death professor at the Paris Conservatory; instrumental in introducing musical dictation into all the larger European conservatories; author of

valuable books, the best known of which is *The Music Dramas of Richard Wagner*; editor in chief of the great *Encyclopédie de la Musique et Dictionnaire du Conservatoire*. Died in Paris in April; born, 1846.

Lazenby, William Rane. American horticulturist and forester, from 1881 professor in Ohio State University; first director of the Ohio Agricultural Experiment Station; officer in various important scientific societies; forest engineer, Biltmore Forest School (1912); lecturer and author. Died September 15; born, 1850.

\* Leavitt, Erasmus Darwin.

Lee, James G. C. American soldier, brigadier-general, U. S. A., retired; veteran of the Civil and Spanish wars, chief quartermaster during the Gettysburg campaign of the former. Died at Hague, Lake George, N. Y., July 26; born, 1836.

Leland, Francis L. American banker and philanthropist, who gave \$1,000,000 to the Metropolitan Museum of Art in 1912; a veteran of the Civil War. Died in New York City, March 28; born, 1840.

Leonard, Adna Bradley. American clergyman, secretary emeritus of the Board of Foreign Missions of the Methodist Episcopal Church. Died in Brooklyn, N. Y., April 21; born, 1837.

\* Leroy-Beaulieu, Paul.

Levy-Lawson, Edward. See Burnham, E. Levy-Lawson, first Baron.

Lewanika, King. Ruler of Barotseland on the Zambesi, who rose from cannibalism to embrace civilization under the influence of the great missionary Coillard. Died February 5; born, c. 1852.

\* Linton, Sir James Dromgole.

\* London, Jack.

Long, Francis. American meteorologist, official forecaster of the Weather Bureau in New York, and a survivor of the Greeley polar expedition. Died in New York, June 8; born, 1852.

\* Lovell, Sir Francis Henry.

\* Low, Seth.

\* Lowell, Percival.

\* Lowther, Sir Gerard Augustus.

\* Lucock, Naphtali.

Lunoi, Alexandre (Joseph). French painter, engraver, and lithographer. Died in Paris, September 2; born, 1863.

Lutz, Frank J. American surgeon, former president of the National Association of Railway Surgeons, surgeon to St. Louis hospitals, and professor of surgery in Washington University. Died in St. Louis, March 24; born, 1855.

Lützwow, Franz, Count. German scholar. Died 1916; born, 1849. See GERMAN LITERATURE, *Necrology*.

\* Lyman, Francis M.

\* Mabie, Hamilton Wright.

\* McClintock, Emory.

MacCunn, Hamish. British composer, writer of two operas and of several cantatas and overtures. Died in London, August 2; born, 1868.

\* McCurdy, Richard Aldrich.

Macfarren, Natalia. English singer and teacher, widow of Sir George Alexander Macfarren; distinguished as a singing teacher; sang contralto rôles in her husband's operas; excellent translator of German operas and songs. Died at Bakewell, April 9; born, 1827.

\* Mach, Ernst von.

\* McKinney, Jenn Webster. See Webster, Jean.

\* McLean, Emily Nelson Ritchie (Mrs. Donald McLean).

\* McLean, John Roll.

MacLeod, Donald. Scottish clergyman, former moderator of the Church of Scotland and chaplain to three sovereigns. Died February 11; born 1831.

Macnaughtan, Sarah. British novelist and lecturer, author of *The Fortunes of Christiana McNab*, *Some Elderly People and Their Young Friends*, *The Three Miss Graemes*, *They Who Question*, etc. She had traveled much and had been a Red Cross worker in Russia and Persia and a speaker at munitions centers since the beginning of the war. Miss McNab left *A Woman's Diary of the War*. Died July 24.

Madero, Francisco. Mexican landowner, supposed to be worth \$6,000,000, and father of Francisco I. Madero, assassinated President of Mexico. Died in New York City, September 3; born, 1849.

\* Markham, Sir Arthur.

\* Markham, Sir Clements Robert.

Marrable, Mrs. Frederick. British painter, president of the Society of Women Artists. Died May 21.

\* Martin, Sir George.

\* Martin, Sir Richard Biddulph.

Martin, William Alexander Parsons. American missionary and educator, president from 1869 to 1894 of the Tung-wen College in Peking and in 1898-1900 of the Imperial University of Peking. Died in Peking, Dec. 18; born, 1827.

\* Mason, Frank Holcomb.

\* Maspero, Gaston.

\* Maxim, Sir Hiram.

Mearns, Edgar Alexander. American army surgeon (with rank of lieutenant-colonel) and naturalist, founder of the American Ornithologists' Union. He accompanied Colonel Roosevelt to Africa in 1909 and went again in 1911. He made valuable zoological, botanical and ethnological collections. Including reports and monographs, his published works number more than 100. Died in Washington, D. C., November 1; born, 1856.

\* Mears, Helen Farnsworth.

Melchior de Vogüé, Charles Jean. See Vogüé.

Menges, General von. German army officer, prominent in the German Fleet Society, which demanded a big navy. His death at Breslau was announced March 5; born 1846.

Menzie, Allan. Scottish theologian, professor of divinity and Biblical criticism in St. Mary's College, St. Andrews University since 1889. Died in St. Andrews, May 8; born, 1845.

\* Mercié, Antonin.

Merrell, John Porter. American naval officer, rear admiral U. S. N., retired, former head of the Naval War College. Died at New London, Conn., December 8; born, 1846.

Merrill, Frederick J. H. American geologist, director of the New York State Museum (1894-1904), State geologist of New York (1899-1904), and since 1913 field assistant of the California State Mining Bureau; director of the New York State scientific exhibits at the Chicago, Buffalo, and St. Louis Expositions; author of many bulletins and articles. Died in Los Angeles, Cal., November 30; born, 1861.

Merritt, Edwin Atkins. American consular and port officer, veteran of the Civil War, former consul general in London and surveyor and collector of the port of New York. Died in Potsdam, N. Y., December 26; born, 1828.

\* Metchnikoff, Elie.

Milholland, Ines. See Boissevain, Inez M.

Miller, Charles Russel. American soldier and lawyer, former commander of the Spanish War Veterans, legal associate of President McKinley, and president of the Ohio Bar Association. Died in Cleveland, Ohio, December 18; born, 1858.

\* Mills, Albert Leopold.

\* Mills, Benjamin Fay.

Millsapugh, Frank Rosebrook. American clergyman, Protestant Episcopal bishop of the diocese of Kansas. Died in Topeka, Kan., November 22; born, 1848.

Miyakawa, Maauji. Japanese lawyer and lecturer on Japan, the first of his race to be admitted to the bar in the United States; lawyer for the defense in the first case brought under the Japanese-American extradition treaty, and counsel for the Japanese children in the San Francisco school case. Died in Los Angeles, Cal., March 4.

Moffat, James David, American educator and Presbyterian clergyman, president emeritus of Washington and Jefferson College. Died at Washington, Pa., November 4; born, 1846.

\* Moltke, Helmuth von.

Monroe, Harry. American mission worker, for 24 years superintendent of the Pacific Garden Mission in Chicago. He started life as a counterfeiter. Died in Chicago, August 1; born, 1848.

\* Moore, Edward.

\* Moore, James Hobart.

Morley, Arnold. British public official, postmaster-general of Great Britain from 1892 to 1895. Died in London, January 16; born, 1849.

Morley, Charles Roberts. British journalist, former editor of the *Pall Mall Budget* and the *Pall Mall Magazine*. Died at Hampstead, April 20.

Morse, Anson Daniel. American educator, professor of history at Amherst College from 1876 till his retirement in 1908. Died at Springfield, Mass., March 13; born, 1846.

\* Mosby, John Singleton.

\* Mounet-Sully, Jean.

Muhlenberg, John Cameron. American soldier, brigadier-general, U. S. A., retired, former paymaster-general of the army. Died in Washington, D. C., March 11; born, 1849.

\* Mulry, Thomas M.

\* Münsterberg, Hugo.

\* Murphy, John Benjamin.

\* Napier, Arthur Sampson.

\* Neisser, Albert Ludwig Siegmund.

Nelson, Julius. American biologist, professor at Rutgers College since 1888 and State biologist of New Jersey. Died at New Brunswick, N. J., February 16; born, 1858.

Neumann, Sir Sigismund. South African financier; created a baronet in 1912. Died at Bournemouth, England, September 13; born, 1857.

Nible Mrs. Fred (Josephine Cohan). American actress and dancer, sister of George M. Cohan and wife of an actor. Died in New York City, July 12; born, 1876.

\* Nicol, Thomas.

Noble, Charles Henry. American soldier, brigadier-

general, U. S. A., retired, veteran of the Civil and Spanish-American wars. Died in Indianapolis, Ind., March 4; born, 1843.

Normoyle, James Edward. American soldier, a major in the army, who directed relief work at the time of the Mississippi floods in 1912 and the Dayton flood in 1913; commandant of Fort Ontario, Oswego, N. Y. Died at his quarters February 10; born, 1867.

- \* Noraworthy, Naomi.
- \* Nott, Charles Cooper.
- \* Novati, Francesco.
- \* Nuttall, Enos.

Oakley, Frank. American circus clown, famous as "Silvers" and noted especially for a baseball act, who had appeared with Barnum and Bailey and at the New York Hippodrome. Died, by committing suicide, in New York City, March 8; born, 1871.

O'Callaghan, Thomas A. Irish prelate, Roman Catholic Bishop of Cork since 1886. Died at Cork, June 14; born, 1839.

\* O'Connell, Joseph J.  
O'Kelly, James. Irish Nationalist, member of parliament since 1895. Died in London December 22; born, 1845.

Olney, George W. American journalist, editor of the *World Almanac* since 1871. Died in New York City June 20; born, 1835.

Ortynsky, Stephen Soter. Prelate, head of the Ruthenian rite of the Roman Catholic Church in the United States. Died in Philadelphia, March 24; born, 1866.

- \* Ott, Isaac.
- \* Otto, former King of Bavaria.
- Quimet, Joseph Alderic. Canadian statesman and jurist, speaker of the House of Commons (1887-91), minister of public works, and later a judge. Died in Montreal, May 14; born 1848.
- \* Oyama, Prince Iwao.

Page, John Henry. American soldier, brigadier-general, U. S. A., retired; veteran of the Civil, Indian, and Spanish-American wars. Died at West Point, N. Y., October 9; born, 1842.

\* Paine, Charles Jackson.  
Palmer, George William. American politician, one of the founders of the Republican party. Died at Plattsburg, N. Y., March 2; born, 1818.

Parker, Charles Pomeroy. American classical scholar, master of St. Paul's School for three years and connected with Harvard University for 33 years (for the last 14 as professor of Greek and Latin). Died in Cambridge, Mass., December 2; born 1852.

Parker, James O. D. American teacher and organist, for many years organist of the Handel and Haydn Society in Boston and professor of theory in the Boston University College of Music; composer of an oratorio and church music; author of text-books on harmony. Died in Brookline, Mass., November 27; born, 1828.

Parsons, Louisa. British nurse, one of the founders of Johns Hopkins Hospital and the University of Maryland Hospital in Baltimore, and earlier a member of Lord Wolsley's Egyptian expedition. Miss Parsons studied under Florence Nightingale and aided Clara Barton. Her death in England was announced November 22.

\* Patterson, Thomas Macdonald.  
\* Pavlov, Ivan Petrovitch.  
Payne, John. British poet and translator, known especially for his rendering of the *Arabian Nights*. Died in London in February; born, 1843.

Peacocke, Joseph Ferguson. British prelate of the Church of Ireland, archbishop of Dublin from 1897 to 1915. Died in London, May 26; born, 1835.

- \* Pearse, Padraic.
- \* Peck, George Wilbur.
- \* Peel, William George.

Peirce, Herbert H. D. American diplomat, former minister to Norway. Died in Portland, Maine, December 5; born, 1849.

Pennell, Harry L. L. British navigator, commander of the *Terra Nova* in Captain Robert F. Scott's two Antarctic expeditions; discovered and named Oates Land; navigated his ship in Ross Sea to 166° west longitude, an easting unsurpassed since 1842; made important contributions to magnetic researches. Killed in the naval battle off Jutland (May-June); born, 1882.

- \* Pennypacker, Galusha.
- \* Pennypacker, Samuel Whitaker.

Peterkin, George William. American clergyman, for nearly 40 years a bishop of the Protestant Episcopal Church—bishop of West Virginia. Died in Parkersburg, W. Va., September 22; born, 1841.

Picard, George Henry. American editor and writer, for many years editor in chief of the McClure Newspaper Syndicate. Died in New York City, October 7; born, 1850.

\* Pitré, Giuseppe.  
Platt, Ward Delos. American clergyman, from 1908 secretary of the Board of Home Missions and Church

Extension of the Methodist Episcopal Church. Died at Brandywine Summit, Pa., May 30; born, 1853.

- \* Plummer, Mary Wright.
- Pochhammer, Paul. German soldier and scholar, known especially for numerous writings on Dante; since 1891 doцент in the Humboldt Academy in Berlin. Died in Berlin, March 1; born, 1841.
- \* Podbielski, Viktor von.
- \* Pohl, Hugo von.

Pownall, George H. English financier, president of the British Institute of Bankers. Died December 16.

- \* Pratt, Silas Gamaliel.
- Prince, Norman. American aviator and soldier, sergeant-major in the Franco-American Aviation Corps on the French front in the European war. Died October 14 of injuries received the week before. His aeroplane fell and both legs were broken. He was the third member of the corps to die. Mr. Prince was a son of Frederick H. Prince of Beverly Farms, Mass.

Pritchard, Arthur John. American naval officer, rear admiral, U. S. N., retired, for many years a paymaster; in the Civil War he served under Farragut. Died in Baltimore, Md., September 5; born, 1836.

Prosser, Charles Smith. American geologist, head of the department of geology at Ohio State University since 1901, and a writer. Died in Columbus, Ohio, September 12; born, 1860.

- Rabinowitz, Solomon. See Aleichem, Scholem.
- \* Ramsay, Sir William.
- \* Ramsey, Joseph, Jr.
- \* Ranger, Henry Ward.
- \* Ranous, Dora Knowlton.
- \* Rasputin, Gregory.
- \* Raymond, Bradford Paul.

Raymond, Charles H. American life insurance official, former associate of Richard H. McCurdy (q. v.), and first president of the Life Insurance Underwriters' Association of America. Died at Morristown, N. J., September 28; born, 1884.

\* Redesdale, Algernon B. Freeman-Mitford, second Baron.

- \* Redon, Odilon.
- \* Reger, Max.
- \* Rehan, Ada.

Rehm, Heinrich. German surgeon and botanist, known especially for his writings on the Ascomycetes (a class of fungi); corresponding member of foreign societies. Died in Munich, April 1; born, 1828.

Reid, John. American sportsman, known as the "father of golf in America," and past president of the United States Golf Association. Died in Yonkers, N. Y., October 7; born, 1840 (at Dunfermline, Scotland).

- \* Ribot, Théodule Armand.
- \* Richter, Hans.

Riddle, Matthew Brown. American theologian, professor in Hartford Seminary and later in the Western Theological Seminary at Allegheny, Pa., last surviving member of the American Committee for New Testament Revision. Died in Pittsburgh, Pa., September 1; born, 1836.

Ridley, Matthew White, second Viscount. British political reformer, chairman of the Tariff Reform League. Died in Newcastle, February 15; born, 1874.

Riesco, Jermain. President of the Republic of Chile for the term ending 1906. The Transandean Railway and other notable improvements were accomplished in his administration. Died December 8.

- \* Riley, James Whitcomb.

Riley, John B. Former State Superintendent of Prisons of New York, known for a bitter controversy with Thomas Mott Osborne, then warden of Sing Sing, in consequence of which Mr. Riley was removed. Died at Plattsburg, N. Y., Nov. 17; born, 1852. See NECROLOGY.

Ringling, Al. American circus proprietor. Died at Baraboo, Wis., January 1; born, 1850.

- \* Robertson, Agnes.
- \* Robertson, Sir George Scott.

Rockwell, Kiffin. American aviator and soldier, second lieutenant in the Franco-American Aviation Corps on the French front in the European war. After gaining honors for brilliant service, killed September 23 in fight with a German aviator near Thann. His home was at Winston-Salem, N. C.

- \* Rodman, William Louis.

Rose, Achilles. American physician, author of books on medical subjects; also a philologist and purist in Greek. Died in New York City, January 10; born, 1839.

- \* Royce, Josiah.
- Rudzik, Maurycy. Polish astronomer, director of the Cracow Observatory and professor in the University of Cracow; author of *Physik der Erde* and of many articles. Died July 22; born, 1862. See ASTRONOMY.

Runciman, John F. British musical writer, music critic of the *Saturday Review*, and author of books. His death was announced April 21.

- \* Russell, Charles Taze.

- \* St. Aldwyn, Michael Edward Hicks-Beach, first earl.  
 \* St. John, John Pierce.
- Salvator von Tokana, Ludwig, Archduke. Austrian nobleman, known for elaborate geographical publications made at his own expense, especially of the Mediterranean region; best known is *Die Balearen in Wort und Bild* (10 vols.). Died in 1916; born, 1847.
- \* Salvini, Tommaso.
- Sandwich, Edward G. H. Montagu, eighth Earl of. British soldier, diplomat, and advocate of mental healing. Died at Hinchingsbrooke, Huntingdon, June 26; born, 1839.
- \* Sant, James.
- \* Sbriglia, Giovanni.
- \* Scannell, Richard.
- Scaradale, Alfred Nathaniel Holden Curson, fourth Baron. British country gentleman and clergyman, rector of Kedleston, father of Earl Curson of Kedleston. Died at Kedleston, March 23; born, 1831.
- Schlenther, Paul. German author, critic, and theatre director, director of the Burgtheater in Vienna from 1898 to 1910 and later literary critic of the *Berlin Tageblatt*; author of many works on German writers and on the theatre. Died in Berlin, May 1; born, 1864.
- \* Schmitz, Bruno.
- Scholem Aleichem. See Aleichem, Scholem.
- Schwab, John Christopher. American librarian and economist, librarian of Yale University and former professor of economics; writer and an editor of the *Yale Review*. Died in New Haven, Conn., January 12; born, 1865.
- Schwarzschild, Karl. German astronomer, director of the Astrophysical Observatory at Potsdam since 1909; author of works on photometry and other subjects in his field. Died May 11; born, 1873. See ASTRONOMY.
- Scott, Robert Henry. British meteorologist, director of the Meteorological Office of Great Britain from 1867 to 1900; fellow of the Royal Society and foreign secretary of the Meteorological Society. Died in London, June 18; born, 1838.
- \* Scott-Moncrieff, Sir Colin Campbell.
- \* Seabury, William Jones.
- \* Sears, Lorenzo.
- Seawell, Molly Elliot. American author, writer of stories, especially historical romances and boys' stories, and winner of large prizes for her work. Died in Washington, D. C., November 15; born, 1860.
- \* Ségur, Marquis Pierre M. M. Henri de.
- \* Seligman, James.
- Sevin, Hector Iréné. French Roman Catholic prelate, archbishop of Lyons and cardinal. Died at Lyons, May 4; born, 1852.
- Seward, Samuel Swayze. American clergyman, prominent in the affairs of the New Church (Swedenborgian). Died at Pittsfield, Mass., February 21; born, 1838.
- \* Sheehan, John Charles.
- Shepard, Irwin. American educator, president of the Minnesota State Normal School at Winona from 1879 to 1898 and secretary of the National Education Association for many years. Died at Winona, April 17; born, 1843.
- \* Sherman, Frank Dempster.
- \* Shively, Benjamin Franklin.
- \* Sienkiewicz, Henryk.
- Sieper, Ernst. German English scholar, professor at the University of Munich. Died in Munich, January 6; born, 1863. See GERMAN LITERATURE, *Necrology*.
- \* Simon, William.
- \* Simpson, Sir Alexander Russell.
- Skeffington, Francis Sheehy. Irish editor. Executed April 25 for his part in the Sinn Fein uprising in Dublin.
- \* Slicer, Thomas Roberts.
- "Slivers." See Oakley, Frank.
- \* Smalley, George Washburn.
- Smith, Sir Cecil Clementi. See Clementi-Smith.
- Smith, Charles Sooy. See Sooy-Smith, Charles.
- Smith, Clinton DeWitt. American agriculturist, formerly professor and experiment station director in the University of Minnesota, and director and dean of the Michigan Agricultural College; from 1913 in extension work for Cornell University. Died in Buffalo, N. Y., August 5; born, 1854.
- Smith, Minnie Colvin. American religious worker and lecturer, wife of Fred B. Smith (leader in the Man and Religion Forward Movement); she toured the world in behalf of this movement. Died in New York City, June 3; born, 1870.
- Smith, Morton Fitz. American soldier, lieutenant-colonel, and commandant of cadets at West Point. Died at West Point, June 16; born, 1872.
- Smith, Reginald John. British journalist and publisher, editor of the *Cornhill Magazine*, and head of Smith, Elder and Company, publishers. His death in London was announced December 28. He was born in 1857.
- Smith, William Sooy. See Sooy-Smith, William.
- Smuts, Tobias. Boer general and legislator, veteran of the Boer War, in which he was a general, and member of the Parliament of the Union of South Africa. Died at Capetown, August 12.
- \* Solms-Laubach, Hermann, Count.
- \* Sooy-Smith, Charles.
- \* Sooy-Smith, William.
- \* Sorsauer, Paul.
- \* Spalding, John Lancaster.
- Spiers, R. Phené. British architect and archaeologist, a president of the British Architectural Association; member of foreign societies; winner of medals for his work; author and editor of architectural books. Died in London, October 4; born, about 1841.
- \* Stanley, William.
- Steinbach, Frits. Noted German orchestral conductor, especially famous as an interpreter of Brahms. Died August 13; born, 1855.
- Stewart, Archibald M. American editor, of Scotch birth, for 55 years editor and proprietor of the *Scottish-American*, a weekly paper. Died in New York City, January 12; born, 1837.
- \* Steyn, Martinus Theunis.
- \* Stickney, Alpheus Beede.
- \* Strachan-Davidson, James Leigh.
- Strakosch, Carl. American impresario, who married the singer Clara Louise Kellogg (q. v.). Died at Hartford, Conn., October 23; born, 1860.
- Strauss, Eduard. Austrian composer of dance music, and member of a famous musical family, his father having been Johann Strauss. Died in Vienna, December 29; born, 1835.
- \* Strong, Josiah.
- \* Stürckh, Count Karl.
- Surratt, John Harrison. The last of the group charged with conspiring to assassinate Abraham Lincoln. He was in Elmira, N. Y., at the time of the assassination, fled to Canada and later abroad, was at last arrested and tried in Washington. The jury, after being out more than 70 hours, reported a disagreement. Surratt had lived for many years in Baltimore, and he died there April 21; born, 1844.
- \* Sweet, John Edson.
- Syva, Carmen. See Elizabeth, Dowager Queen of Rumania.
- Taylor, Howard P. American dramatist, who collaborated with Mark Twain in making *A Connecticut Yankee at King Arthur's Court* into a play; author of a number of plays known some years ago. Died in New York City, July 7; born, 1838.
- \* Taylor, James Monroe.
- \* Thebes, Madame de.
- Thédanat, Abbé Henri. French cleric and archaeologist, known especially for researches in Roman remains; member of the Academy of Inscriptions and Belles-Lettres and of many other societies. Died in Paris, October 30; born, 1844.
- Theotokis, G. N. Greek statesman, several times premier and holder of various portfolios. Died in Athens, January 25.
- Thompson, Ralph Wardlaw. British clergyman, foreign secretary of the London Missionary Society from 1881 to 1914, and chairman of the Congregational Union of England and Wales. Died in London, June 12.
- \* Thompson, Silvanus Phillips.
- Thomson, John. American librarian, from 1894 librarian of the Free Library of Philadelphia and author of reference works. Died in Philadelphia, February 23; born, 1836.
- Thundercloud, Chief. Blackfoot Indian warrior, scout with the United States army in several Indian wars and a model who had sat to noted artists. Died in Rochester, N. Y., March 12; born, 1857.
- \* Thurston, John Mellen.
- Tiffany, Louis McLane. American surgeon and educator, professor emeritus of medicine in the University of Maryland. Died at his country home, Mount Custis, Accomac County, Va., October 28; born, 1844.
- Tokana, Ludwig, Archduke Salvator von. See Salvator.
- Torp, Alf. Norwegian comparative philologist, professor at Christiania University and author of important works. Died in 1916; born, 1853.
- \* Tosti, Sir Francesco Paolo.
- \* Tozer, Henry Fanshawe.
- Treves, Emilio. Italy's leading publisher of his time, founder of the Treves Company of Milan. Died in 1916; born, 1834.
- Treves-Tedeschi, Virginia. One of the most popular Italian novelists, who used the pseudonym "Cordelia." Died in 1916; born, 1855.
- Triana, Santiago Peres. South American diplomat, former Colombian minister in London, and at the time of his death representative of Nicaragua in the same capital; former member of the Permanent Court of Arbitration at The Hague and a delegate to the Pan-American Conference at Washington in 1916. Died in London, May 24.
- \* Troward, Thomas.
- \* Trowbridge, John Townsend.

- \* Truman, Benjamin Cummings.
- \* Turner, Sir William.
- Ulrich, Pauline. German actress, widely known for more than half a century in her own country. Her death in Dresden was announced May 26.
- Underwood, Horace Grant. American missionary, the first Presbyterian minister to settle in Korea, and prominent there since 1884; president of Union College in Seoul. Died in Atlantic City, N. J., October 12; born, 1859.
- Valentine, Robert Grosvener. American public official, supervisor of Indian schools in 1908, commissioner of Indian Affairs from 1909 to 1912, and since 1913 chairman of the first Massachusetts Minimum Wage Board. Died in New York City, November 14; born, 1872.
- \* Van Horn, Robert Thompson.
- \* Verhaeren, Emile.
- Vicenti, Alfredo. Spanish journalist, editor of *El Liberal*. Died September 30.
- \* Vincent, Frank.
- Vizetelly, Arthur. British translator, one of the sons of Mr. Henry Vizetelly; known especially for translations of Zola and other French writers. Died in London, April 30; born, 1855.
- \* Vogrich, Max.
- \* Vogüé, Charles Jean Melchior de.
- Volpe, Francis, Cardinal Della. Italian Roman Catholic prelate, created a cardinal in 1899, appointed Chamberlain of the Church in 1914, and at the time of his death Prefect of the Congregation of the Index. Died in Rome, November 5; born, 1844.
- Von der Goltz, Kolmar. See Goltz.
- Von Ebner-Eschenbach, Marie, Baroness. See Ebner-Eschenbach.
- Von Erdmannsdörfer-Fichtner, Pauline. See Erdmannsdörfer-Fichtner.
- Von Mach, Ernst. See Mach.
- Von Menses, General. See Menges.
- Von Moltke, Helmuth. See Moltke.
- Von Podbielski, Viktor. See Podbielski.
- Von Pohl, Hugo. See Pohl.
- Von Tokana, Ludwig, Archduke Salvator. See Salvator.
- \* Voorhees, Theodore.
- \* Vreeland, Charles E.
- \* Wait, William Bell.
- \* Walker, Asa.
- Wallace, Henry. American editor and agricultural writer, founder and editor of *Wallace's Farmer*, member of a commission appointed by President Roosevelt to investigate rural conditions, and president of the third National Conservation Congress in 1910-11. Died at Des Moines, Ia., February 22; born, 1836.
- \* Wallace, Sir William.
- \* Ward, Wilfrid.
- \* Ward, William Hayes.
- Warner, William, American lawyer, soldier, and legislator, a veteran of the Civil War, in which he was promoted to major; elected national commander of the G. A. R. in 1898; former United States district attorney and United States senator from Missouri. Died in Kansas City, Mo., October 4; born, 1840.
- Watson, Sir Charles Moore. British soldier, a colonel in rank, friend and lieutenant of General "Chinese" Gordon, and captor of the Citadel of Cairo after the battle of Tel-el-Kebir in 1882; British delegate to several International Navigation Congresses; commissioner-general to the St. Louis Exposition in 1904, and author. Died in London, March 15; born, 1844.
- \* Watson, David Thompson.
- Wavell, Arthur J. B. British explorer and soldier, known for travels in Swaziland, Bechuanaland, and Kaliahari for a pilgrimage in disguise to Mecca, and for a journey through Hodeida. He prepared maps and wrote *A Modern Pilgrim in Mecca*; major of the Welch Regiment. Killed in battle at Mwle, British East Africa, January 8 or 9, when in command of the Arab Rifles; born, 1882.
- Webster, Francis Marion. American entomologist, at the time of his death in charge of the cereal and forage-crop insect investigations of the United States Department of Agriculture; contributor to American and foreign journals in his field. Died in Columbus, Ohio, January 3; born, 1849.
- \* Webster, Jean.
- Wells, Webster. American mathematician, from 1893 to 1911 professor of mathematics in the Massachusetts Institute of Technology; author of numerous text-books. Died in Boston, May 23; born, 1851.
- Werner, William E. American jurist, associate justice, since 1900, of the Court of Appeals of New York State. Died in Rochester, N. Y., March 1; born, 1855.
- Wetherbee, Gardner. American hotel proprietor, who, as member of the firm of Hawk & Wetherbee, built and managed the Hotel Manhattan in New York City. Died in New York, March 24; born, 1832.
- \* Whipple, Leander Edmund.
- Whittbeck, John Fonda Ward. American physician, president of the Medical Society of the State of New York in 1913, and president of the staff of the Rochester General Hospital. Died in Rochester, July 3; born, 1844.
- White, Sir George. British electric traction pioneer and builder of the first aeroplane factory in England. Died in Bristol, November 22; born, 1854.
- \* White, Horace.
- White, James Clarke. American dermatologist, professor of chemistry and dermatology in the Harvard Medical School from 1871 to 1902 and connected with the skin disease department of the Massachusetts General Hospital. Died in Boston, January 6; born, 1838.
- \* White, J(ames) William.
- Whitridge, Frederick Wallingford. American capitalist, president of several important electric traction lines in New York City and its suburbs, and writer of political and economic articles. Died in New York, December 30; born, 1852.
- \* Whittemore, Don Juan.
- Wieck, Marie. German pianist; sister of Clara Schumann; took part in the Schumann centenary celebration in 1910; last public appearance in November, 1915. Died in Dresden in November; born, 1832.
- \* Willberforce, (Albert) Basil (Orme).
- Williamson, Benjamin. Irish mathematician, professor of natural philosophy and vice provost of Trinity College, Dublin; author of important contributions on mathematics. Died in Dublin, January 3; born, 1827.
- Wilson, Alpheus Waters. American clergyman, bishop of the Methodist Episcopal Church since 1882. Died in Baltimore, November 21; born, 1834.
- \* Wilson, Sir Charles Rivers.
- Wilson, Samuel Graham. American missionary and educator, since 1880 principal of the Memorial Training School at Tabriz, Persia; writer on Persia, and prominent in Armenian relief work during the War of the Nations. Died in Tabriz, July 2; born, 1858.
- \* Wolf, Henry.
- Wolf, Alfred. German dermatologist, professor of dermatology and director of a clinic in the University of Strassburg, though resident in Berlin; president of the German Dermatological Society in 1898; author of important treatises. Died 1916; born, 1850.
- Wolffram, Charles B. German-American journalist, a pioneer in his field, editor and publisher of the *New Yorker Herald*, which he founded in 1880. Died in New York City, April 8; born, 1848.
- Woodruff, Henry Mygatt. American actor, who had taken the leading part in *Jim the Penman*, had created the title rôle in *Ben Hur* and had starred in *Brown of Harvard*. Died October 6; born, 1869.
- Woods, Matthew. American physician, noted as a specialist in epilepsy; writer on professional subjects and in other fields; past president of the Philadelphia Browning Society and the Philadelphia Society of Arts and Letters. Died in Philadelphia, October 13; born, 1849.
- Woodward, Julius Hayden. American physician and educator, director of instruction in the ophthalmological department of the New York Post-Graduate Hospital Medical School. Died in New York City, July 2; born, 1858.
- Woolley, Edwin Campbell. American scholar and educator, assistant professor of English in the University of Wisconsin since 1909 and author of college text-books. Died in New York City, January 26; born, 1878.
- Young, Nicholas E. American baseball pioneer, president of the National League from 1881 to 1903. Died in Washington, D. C., October 31; born, 1840.
- Younger, Cole. One of the three "Younger Boys," who were notorious outlaws after the Civil War, confederates of the James boys. The three were caught finally and (1889) committed for life to a Minnesota penitentiary. Bob Younger died there; Cole and James were paroled in 1901. The latter committed suicide the next year, but Cole settled down and became a model citizen. Died at Lee's Summit, Mo., March 21; born, 1844.
- \* Yuan Shih-kai.
- \* Yusuf Iszeddin.
- Zollars, Ely Vaughan. American educator, president in succession of several colleges, since 1888 president of Hiram College (Ohio); author of religious works. Died at Warren, Ohio, February 10; born, 1847.
- Zumbini, Bonaventura. Italian critic and litterateur, one of the leading literary figures of the generation which included Carducci, Graf, d'Ancona, and Pascoli. Died in 1916; born, 1840.

NEGRI SEMBILAN, THE (NINE STATES). A Federation of states composing a state of the Federated Malay States (q. v.).

NEIGHBORHOOD PLAYHOUSE. See DRAMA.

**NEISSER, ALBERT LUDWIG SIEGMUND.** A German dermatologist, died at Breslau July 30, 1916. He was born at Schweidnitz, German Silesia, in 1855, studied at Erlangen and Breslau. At the latter university he took his medical degree in 1877 and he was identified with it during all but two years of his career as a teacher. Since 1907 he had been professor of dermatology and syphilis and director of the dermatological clinic. In the study of leprosy he traveled widely. Besides investigating this disease and syphilis, Professor Neisser conducted researches on gonorrhoea, and discovered the gonococcus. His writings on the subjects in which he specialized include more than 100 titles.

**NEO-SALVARSAN.** See TRICHINOSIS.

**NEPOL.** An independent Himalayan kingdom covering about 54,000 square miles, and having a population estimated at 3,000,000. Katmandu, with some 50,000 inhabitants, is the capital.

**NEPTUNE.** See ASTRONOMY.

**NETHERLANDS, THE (or HOLLAND).** A constitutional monarchy of western Europe, lying between Germany and the North Sea; a neutral in the War of the Nations. Capital, The Hague.

**AREA AND POPULATION.** The total area, including the rivers of Zeeland and South Holland, the Zuider Zee, the Dollart, and the Wadden (the shallows extending along the shores of Friesland and Groningen as far as the Dollart), based on a low-tide planimetric calculation, is 40,828.71 square kilometers (15,764 square miles). The land area by provinces, the population according to the census of Dec. 31, 1909, together with the population as calculated Dec. 31, 1914, and the density per square kilometer in 1914, are given in the table below.

	Sq. km.	1909	1914	S.
North Brabant . . .	4,973.84	623,079	670,020	131
Gelderland . . . .	5,024.40	639,602	188,775	71
South Holland. 2,981.00	1,890,744	872,625	112	
North Holland. 2,762.01	1,107,698	345,649	146	
Zeeland . . . . .	1,831.75	232,515	681,824	134
Utrecht . . . . .	1,363.21	288,514	1,202,652	430
Friesland . . . . .	3,220.25	359,552	1,537,568	491
Overijssel . . . . .	3,354.50	382,880	882,682	173
Groningen . . . . .	2,283.52	328,045	410,826	121
Drenthe . . . . .	2,662.09	173,318	307,547	222
Limburg . . . . .	2,194.68	332,007	239,676	88
<b>Total . . . . .</b>	<b>32,600.25*</b>	<b>5,858,175</b>	<b>6,339,854</b>	<b>185</b>

\* 12,587 square miles.

Like the Flemish, the Dutch belong to the Low-German branch of the Teutonic race. The majority of the population are Protestants. Dutch, 5,788,193; German, 37,534. There were 42,539 marriages in 1914, 176,831 births, 77,739 deaths, 6899 stillbirths; 2174 emigrants. Communal population (Dec. 31, 1914) of Amsterdam, 609,084; Rotterdam, 472,520; The Hague, 312,480; Utrecht, 127,086; Groningen, 82,809; Haarlem, 71,883; Arnhem, 66,129; Leiden, 59,560; Nimeguen, 60,515; Tilburg, 55,736; Dordrecht, 49,952; Maastricht, 39,572; Apeldoorn, 40,542; Leeuwarden, 39,130; Bois-le-Duc, 36,034; Enschede, 37,909; Delft, 35,402; Schiedam, 35,166; Zwolle, 34,187; Hilversum, 33,637; Emmen, 33,166; Deventer, 29,926; Breda, 27,769.

**EDUCATION.** Primary instruction is compul-

sory and free in the public schools, which are provided by local taxation where private institutions are lacking. In preference, however, to maintaining public schools, the government encourages and subsidizes private instruction. The number of public elementary schools reported in 1913-14 was 3334, with 19,843 teachers and 564,314 pupils; private, 2268, with 13,403 teachers and 394,793 pupils. Public infant schools, 177, with 34,208 pupils; private, 1127, with 109,625. The average attendance is 95 per cent. Secondary instruction is not free. The special schools are excellent and well attended. There are universities at Amsterdam, Groningen, Leiden, and Utrecht, as well as a small private university.

**PRODUCTION.** The land is flat and low, and traversed by numerous rivers and canals. Grains, flax, hemp, root crops, and tobacco are grown. Poultry, eggs, and dairy products are exported. Of the productive area, 872,171 hectares are classed as arable, 1,213,073 pasture, 78,097 gardens and orchards, 260,923 forest. The following table shows area and production of main crops in 1912 and 1916 (1916 figures subject to slight revision), with production per hectare in 1912:

	Hectares		Quintals		Qa. ha.
	1912	1916	1912	1916	
Wheat . . . . .	57,854	54,850	1,501,007	1,098,000	25.9
Rye . . . . .	228,044	201,746	4,026,718	3,147,560	17.7
Barley . . . . .	26,861	24,246	723,518	543,775	27.3
Oats . . . . .	137,863	138,820	2,645,088	3,228,000	19.2
Flax * . . . . .	14,862	14,640	98,197	92,311	...
Beets † . . . . .	64,824	68,643	21,760,860	19,188,000	335.7

\* Fibre production. † Sugar beets.

Quantities of bulbs, shrubs, trees, vegetables, and fruits are raised for export, the total shipments of bulbs, shrubs, and trees being valued in 1914 at 21,350,521 guilders (15,230,483 gl. in 1910), vegetables, 18,285,870 (64,800,000), fruits, 6,762,254 (3,188,000).

Planted to potatoes in 1916 were 167,173 hectares (171,753 in 1915, 123,385 in 1914), yielding 20,054,000 quintals (23,883,603 in 1915, 25,257,750 in 1914).

The coal mines belong mostly to the state; total output (1914), 1,928,540 metric tons, valued at 14,471,000 gl. There were reported (1914) 384 distilleries, 10 sugar refineries, 27 beet sugar refineries, 31 salt works, 413 breweries, 60 vinegar factories. The output of the herring fisheries (North Sea) was valued at 12,595,000 gl.

**COMMERCE.** The export of cereals and flour has been prohibited since Aug. 3, 1914, of cotton since August 7th, and of linseed since Sept. 24, 1914. The decree of Jan. 26, 1915, suspending provisionally the prohibition on the export of raw cotton, has been annulled by a royal decree of June 2, 1915.

By order of the minister of agriculture dated Nov. 25, 1915, permits may be granted for the export of restricted amounts of linseed of Dutch origin.

The government reserves the right to grant exceptions in certain cases from these prohibitions of export, and a law of March 11, 1916, enacts that a charge is to be made to cover the cost of issue of any licenses for this purpose. Export licenses are only issued for definitely described quantities and for a period not ex-



ceeding one month. The maximum charge is 50 cents per quintal, or one-eighth per cent ad valorem.

The total imports for consumption and exports of domestic produce are seen below for three years (precious metals included), in guilders (par value of the guilder, 40.196 cents):

	1912	1913	1914
Imports	3,613,000,000	3,917,800,000	2,889,000,000
Exports	3,113,100,000	3,082,900,000	2,505,000,000

A comparison of some of the principal articles of trade, imports with exports, is of interest as an indication of the chief sources of the nation's wealth and the corresponding necessities not supplied by home production (values in thousands of guilders, 1914):

Imports	1000 gl.	Exports	1000 gl.
Cereals, etc.	397,908	Iron and steel	247,032
Iron, etc.	375,744	Flour, etc.	281,567
Textiles	186,125	Textiles	174,551
Fuel	115,706	Copper	99,717
Rice, etc.	105,719	Paper	85,690
Copper	99,259	Rice flour	72,588
Wood	73,892	Margarine	71,749
Gold, etc.	62,840	Sugar	59,736
Fertilizers	60,444	Coffee	48,752
Seeds	48,683	Butter	38,287
Coffee	54,978	Skins	37,135
Dyes	19,352	Cheese	23,746

The table below gives countries of origin and destination in the 1914 and 1913 trade, values in millions of guilders; it must be borne in mind, however, that while oversea trade is generally credited to the country of first origin, trade by the frontiers is credited to the immediate transmitter, so that much of the trade with France is classed as Belgian, etc.:

	Imports		Exports	
	1914	1913	1914	1913
Germany	875.7	1,058.6	1,043.5	1,363.2
D. E. Ind.	395.0	528.5	143.2	162.8
U. K.	326.3	340.8	602.2	633.8
Belgium	245.9	352.1	219.5	339.6
U. S.	300.7	442.7	164.0	131.3
Russia	188.2	366.1	21.7	30.6
Spain	70.0	99.4	....	....
Br. E. Ind.	89.4	99.9	....	....
Hamburg	47.1	68.1	33.7	59.4
France	27.4	33.2	23.1	31.4

There entered at the ports in the 1914 trade, 12,484 vessels, of 13,540,000 tons (Dutch, 4320, of 4,575,000); cleared, 12,669, of 13,565,000 (4480, of 5,653,000).

Holland is practically free trade and the only duties levied are of a fiscal character. Merchant marine, Jan. 1, 1915, 407 steamers (719,669 tons) and 402 sailing (47,150).

COMMUNICATIONS. On Jan. 1, 1915, there were in operation 3339 kilometers of railway. The land is a network of canals and rivers. State telegraph lines, 1913, 8098 kilometers; wires, 40,354 kilometers. Post offices, 1537.

FINANCE. The guilder (par value 40.196 cents) is the unit of value. In the table below are given revenue and expenditure for comparative years, in guilders:

	1912	1913	1914
Rev. ordinary	211,443,000	223,507,000	224,927,000
Rev. extraord.	1,958,000	3,915,000	20,639,000
Total	213,401,000	227,422,000	245,566,000

Expenditure:	1912	1913	1914
Defense	49,188,000	52,909,000	143,030,000
Debt	37,593,000	38,021,000	40,175,000
Pub. works	15,159,000	17,162,000	24,492,000
General	122,725,000	130,685,000	184,697,000
Total	224,665,000	238,727,000	342,394,000

The budget estimates for 1915 placed revenue and expenditure at 294,977,657 and 216,207,000 guilders respectively; 1916 budget, 272,653,314 and 224,703,460 guilders. The debt stood Jan. 1, 1916, at 1,405,991,000 guilders.

NAVY. See NAVAL PROGRESS.

GOVERNMENT. By the constitution of 1848 (amended 1887) the executive power rests in a sovereign, and the legislative in the sovereign and a parliamentary body composed of two chambers. The upper chamber has 50 members, elected for nine years by the provincial states and possesses powers of approval or rejection, not of amendment. The lower, composed of 100 popularly elected members, possesses solely the right of legislative initiative. A consultative state council of 14 members is appointed by the sovereign.

Wilhelmina, the reigning queen, was born Aug. 31, 1880; she succeeded her father Nov. 23, 1890, her mother acting as regent till Aug. 31, 1898. She married, Feb. 7, 1901, Duke Henry of Mecklenburg-Schwerin. The heiress-apparent is Princess Juliana, born April 30, 1909.

HISTORY. The strain on Dutch neutrality was very severe. Great indignation was caused by the torpedoing of Dutch vessels by the Germans, especially the *Palembang* on March 18th and the *Tuban* on March 16th. On the other hand, the British Orders in Council, with their restriction of Dutch trade, also aroused indignant protests. In April the situation seemed so serious that military measures were taken, and it was thought that Holland might be involved in the war. It was necessary to keep up border patrols and enforce other war precautions, and these duties involved such heavy expenditures that a war loan was required. In spite of these new expenses the government tried to carry through the old-age pension measure. A ministerial crisis ensued in January. On February 3rd the finance minister, Treub, resigned and was succeeded by Van Gijn February 11th. The country suffered, along with other European nations, a shortage of flour. This had developed early in the war and the baking of white bread was at that time prohibited. Down to April, 1916, conditions seemed normal but soon after that flour became scarce again and in June the government was again obliged to prohibit the baking of white bread. On November 15th, Parliament voted unanimously a constitutional amendment providing for universal suffrage and at the same time removing the sex disability of women, though the actual grant of the vote to women depended on the passage of an electoral measure at a future date. The Lower House on November 17th voted to make women eligible to membership in the States-General.

The high tides following severe storms on the coast caused the collapse of the dikes at several points on the Zuider Zee January 14th-20th, and the loss of many lives and of property valued at \$100,000,000. Damage from flood continued to occur near Amsterdam and at

other points in the north. Dams burst at Punnereud and Monnokendam. The towns of Volendam and Edam suffered severely and a large part of the surrounding country was inundated.

**NEUTRALITY.** See CONTRABAND OF WAR; UNITED STATES AND THE WAR; WAR OF THE NATIONS.

**NEVADA. POPULATION.** The population of the State on Dec. 31, 1916, was 108,736. The population in 1910 was 81,975.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn .....1916	1,000	34,000	\$42,000
.....1915	1,000	35,000	38,000
Wheat .....1916	55,000	1,592,000	2,229,000
.....1915	56,000	1,660,000	1,557,000
Oats .....1916	14,000	602,000	452,000
.....1915	13,000	585,000	322,000
Potatoes ....1916	14,000	2,660,000	3,458,000
.....1915	13,000	2,286,000	1,565,000
Hay .....1916	225,000	540,000	5,184,000
.....1915	235,000	675,000	5,062,000
Barley .....1916	12,000	492,000	467,000
.....1915	12,000	576,000	408,000

a Tons.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments.....	177	180
Average number of wage earners.....	2,257	3,655
Capital invested.....	\$9,808,000	\$13,591,000
Wages.....	1,982,000	3,578,000
The value of materials used....	8,366,000	9,317,000
The value of products.....	11,887,000	16,083,000

**MINERAL PRODUCTION.** The value of the gold, silver, copper, lead, and zinc from the mines of the State in 1916 was approximately \$52,475,000, according to the estimates of the United States Geological Survey. This represents an increase of nearly \$18,000,000, or about 52 per cent over 1915. There were large increases and record productions in copper, lead, and zinc, a slight decrease in silver, and a decrease in gold. The gold output was valued at approximately \$9,000,000, a decrease of 22 per cent from the output of 1915. The mined production of silver was about 13,680,000 ounces, a decrease from 14,459,840 ounces in 1915. The value of the output on account of the higher prices of silver increased from \$7,331,139 to about \$9,000,000, or 23 per cent. The production of copper increased from 68,636,370 pounds in 1915 to over 103,000,000 pounds in 1916, an increase of nearly 35,000,000 pounds, with a great increase in value from \$3,022,680 to \$4,759,000, or 57 per cent.

The silver mines of the State in 1915 showed a decrease of about 975 ounces, following a similar decrease in 1914.

**TRANSPORTATION.** The total railway mileage of the State in 1916 was 2831. Of this, 2269 miles were main track. Railroads having the longest mileage are the Southern Pacific, 746; Western Pacific, 427; the Los Angeles and Salt Lake, 212.

**EDUCATION.** The total school population of the State in 1916 was 14,087, with an enrollment of 12,941, and an average daily attendance of 9456. There were 94 men and 563 women teachers. Men teachers received an average monthly salary of \$133.41, and women, \$87.55.

**FINANCE.** The total receipts for the fiscal year 1916 amounted to \$1,814,412, and the disbursements to \$1,488,392. There was a balance on Jan. 1, 1916, of \$302,420, and on Dec. 31, 1916, of \$628,440.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions of the State include the Orphans' Home, State Prison, and Nevada Hospital for Mental Diseases. The Crittenton Home at Reno receives aid from the State, but is not under State supervision.

**POLITICS AND GOVERNMENT.** Nevada, prior to the election of November, was classed as a somewhat doubtful State in regard to national issues, and its vote was cast for President Wilson. He received 17,776 votes, and Huges 12,127. The vote for the Socialist and Prohibitionist candidates was very small. Senator Key Pittman, Democrat, was reelected, defeating Republican and Socialist candidates. The main issue in the Senatorial fight was the Pittman land grant bill, which was introduced into Congress by Senator Pittman. Strong opposition developed against this measure, and while Senator Pittman was reelected, he was a minority candidate. Congressman Roberts, Republican, returned to Congress for the third time. On the plea of removing the State University from the zone of politics, the three Republican candidates, Benjamin F. Curler, George Abel, and Mrs. Edna C. Baker, were elected. This fight was waged in connection with the opposition to the Pittman land bill, it having been charged that university officials had lobbied at Washington for the measure. J. A. Sanders was elected justice of the Supreme Court. Mr. Sanders was a Democrat, but political affiliations of supreme court candidates do not appear on the ballot. For the first time in the history of the State women cast votes for president.

**STATE OFFICERS.** Governor, Emmet D. Boyle; Lieutenant-Governor and Adjutant-General, Maurice J. Sullivan; Secretary of State, George Brodigan; Treasurer, Edward Malley; Comptroller, George A. Cole; Superintendent of Public Instruction, John Edward Bray; Attorney-General, George B. Thatcher—all Democrats.

**JUDICIARY.** Supreme Court: Chief Justice, P. A. McCarron; Justices, Benjamin W. Coleman and J. A. Sanders; Clerk, H. R. Mighels.

**STATE LEGISLATURE:**

	Senate	House	Joint Ballot
Republicans .....	10	24	34
Democrats .....	8	25	33
Independents .....	3	5	6
Socialists .....	1	1	2

**NEVADA, UNIVERSITY OF.** A State co-educational institution at Reno, Nev., founded in 1873. The total enrollment for the fall of 1916 was 401, 224 men and 117 women. Including the experiment station and extension workers, the faculty numbered 59. For the past biennial, the appropriations for the use of the university have been \$266,837 from the State and \$194,360 from the Federal government. The

university also administers money for the board of stock commissioners, the Tonopah School of Mines, and for irrigation investigations. The library contains 35,000 volumes. President, Archer Wilmot Hendrick.

**NEVILLE, KEITH.** Elected Democratic Governor of Nebraska, Nov. 7, 1916.

**NEW, HARRY STEWART.** Elected Republican United States Senator from Indiana, Nov. 7, 1916.

**NEWARK, N. J.** See CELEBRATIONS; CITY PLANNING; MUSIC, *Festivals.*

**NEWBOLT, SIR HENRY.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction, English.*

**NEW BRUNSWICK.** One of the Maritime provinces of the Dominion of Canada, situated east of the State of Maine and south of Quebec. The capital is Fredericton. The area is 27,985 square miles, of which 74 water. Between 1901 and 1911 the population increased 6.27 per cent, or from 331,120 to 351,889. In 1911 the city of St. John had 42,511 inhabitants; Moncton (now the eastern terminus of the National Transcontinental Railway), 11,345; Fredericton, 7208. Of the population 10 years of age and over in 1911, males numbered 136,196 (51.27 per cent) and females 129,453 (48.73); of these, 103,275 males and 16,491 females were reported as employed in gainful occupations. Of the males employed, 43.4 per cent were in agriculture, 15.7 per cent in manufacturing, and 11.4 in the building trades; of the females, 40.3 per cent were in domestic and personal service, 23.8 per cent in manufacturing, and 18.1 per cent professional.

The provincial government is administered by a lieutenant-governor, appointed for five years by the Governor-General of the Dominion; he acts through an executive council, or responsible ministry of six members. The legislative power is vested in the House of Assembly, a single chamber of 48 members elected by direct vote for five years. In the 12th Parliament, which convened in 1911, New Brunswick was represented by 10 senators and 13 members of the House of Commons; the representation in the Commons on the basis of the 1911 census, is 11. The lieutenant-governor in 1916 was Josiah Wood, appointed March 6, 1912, in succession to L. J. Tweedie.

**NEW CALEDONIA.** A French Melanesian colony which, with the Loyalty Islands and other dependencies, covers 18,653 square kilometers, with 50,680 inhabitants. The dependencies are Wallis Archipelago, 96 square kilometers and 4500 inhabitants; Fortuna and Alofi, 159 square kilometers and 1500 inhabitants; Chesterfield Islands, 0.8 square kilometers. The capital of the colony is Nouméa, with 6968 inhabitants. Imports (1914), £664,160; exports, £618,760. The 1913 budget balanced at 4,342,621 francs. Railways, 16 kilometers; telegraph lines, 1042 kilometers (wire, 1650).

**NEW CHURCH.** See CHURCH OF THE NEW JERUSALEM.

**NEWFOUNDLAND.** A British colony; an island on the northeast side of the Gulf of St. Lawrence. Area, 42,734 square miles. Population (1911), 242,619, including 3949 in Labrador, of which the coastal portion comprehended between Hudson Strait and Blanc Sablon, including the Hamilton basin, is attached administratively to Newfoundland. Population 1914,

251,723 (Labrador, 4016). Capital, St. John's, with 32,292 inhabitants. The fisheries occupy the majority of the population, cod being the chief export—1,132,720 quintals, valued at \$6,544,604 in 1910-11, besides 300,000 quintals retained for local consumption; exports 1913-14, 1,247,314 quintals, valued at \$8,071,889. Agriculture, mining, and lumbering are carried on. At Grand Falls and Bishop's Falls are large pulp and paper mills. The government railway from St. John's to Harbor Grace is 84 miles long, and the branch to Exploits is 200 miles long; and the line, recently completed, from Exploits to Port-Aux-Basques, 285 miles. Total length, with branches to Brigus, Tilton, Carbonar, and Burnt Bay, about 638 miles. Length of lines under construction to Trinity, Bonavista, Heart's Content, Trepassay, Fortune Bay, and Bonne Bay, about 300 miles. Trade and finance statistics are given below:

	1910-11	1911-12	1913-14
Imports .....	\$18,888,910	\$14,783,490	\$15,193,785
Exports .....	11,975,747	18,874,809	15,134,548
Revenue .....	8,527,126	8,786,456	8,618,829
Expenditure ...	8,854,747	8,524,653	8,920,178
Ship.* .....	2,251,595	2,194,103	2,781,278

\* Tonnage entered and cleared.

The export of wheat and oats is prohibited to all destinations, that of corn, linseed, barley, and oatmeal to all destinations other than the United Kingdom and British possessions and protectorates. The export of raw cotton, corn, meal, rice, and rye, with their products, to all foreign countries in Europe and on the Mediterranean and Black seas, other than France, Russia (except through Baltic ports), Italy, Spain, and Portugal is also prohibited. The proclamations now in force are dated Sept. 6, Oct. 5, Nov. 9 and 23, and Dec. 14, 1915, Jan. 4, Feb. 12, March 14, 27, and April 4, 1916.

Customs revenue, 1913-14, \$3,083,313. Public debt, June 30, 1915, \$31,426,765.

**NEW GUINEA.** The largest of the East Indian islands and after Australia and Greenland the largest island in the world. The area is not known exactly, but may be placed at about 310,000 square miles. The number of inhabitants is still more conjectural, but is estimated at slightly less than 1,000,000. See DUTCH EAST INDIES; KAISER-WILHELMSLAND; GERMAN NEW GUINEA; PAPUA.

**NEW HAMPSHIRE.** POPULATION. The population of the State on Dec. 31, 1916, was 443,467. The population in 1910 was 430,572.

AGRICULTURE. The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn .....	1916 19,000	874,000	\$1,005,000
	1915 22,000	990,000	752,000
Oats .....	1916 12,000	444,000	306,000
	1915 12,000	456,000	246,000
Potatoes ...	1916 15,000	1,800,000	2,988,000
	1915 16,000	1,520,000	1,444,000
Hay .....	1916 529,000	a 767,000	11,122,000
	1915 504,000	504,000	8,770,000
Tobacco .....	1916 100	b 165,000	28,000
	1915 100	140,000	17,000
Barley .....	1916 1,000	28,000	25,000
	1915 1,000	30,000	24,000

a Tons. b Pounds.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments..	1,961	1,786
Average number of wage earners .....	78,658	78,998
Capital invested .....	\$189,990,000	\$156,749,000
Wages .....	86,200,000	40,642,000
The value of materials used	98,157,000	114,998,000
The value of products.....	164,511,000	182,844,000

**TRANSPORTATION.** The total railway mileage of the State on June 30, 1915, was 12,052. There was no construction during 1916.

**EDUCATION.** The total school population of the State in 1916 was 78,899. The total enrollment was 77,996, and the average daily attendance 54,485. The last figure is for the elementary schools only. There were 2493 teachers in the elementary schools, and 554 in the secondary schools. The average yearly salary of men teachers in the secondary schools was \$1379, and of women teachers \$630. The average monthly salary of men teachers in the elementary schools was \$73.12, and of women teachers \$46.49.

**FINANCE.** There was a balance in the treasury on Sept. 1, 1915, of \$616,121. The total receipts for the year ending Aug. 31, 1916, amounted to \$3,557,514, and the disbursements to \$3,502,242, leaving a balance on Sept. 1, 1916, of \$671,393. The total indebtedness of the State on Sept. 1, 1916, was \$1,068,954.

**CHARITIES AND CORRECTIONS.** The State board of charities and corrections has charge of the charitable and correctional institutions of the State. These include the State Hospital for the Insane, New Hampshire State Prison, State Sanatorium, State Industrial School, School for Feeble-Minded, New Hampshire Soldiers' Home, and county jails in each of the counties. The county prisons and jails are also under the supervision of the board. It has general control in addition of a number of private institutions.

**POLITICS AND GOVERNMENT.** The political events of 1916 in New Hampshire related exclusively to election matters, as the legislative sessions are biennial. The primary election law had been extended to the choice of delegates to the national political conventions, and such vote was taken at the time of the annual March meeting for the election of local officials in the towns, with a special election in the cities. For such delegate elections, there were no contests; the Democrats chosen were pronouncedly in favor of the renomination of President Wilson and the Republicans were divided, a minority being avowedly in favor of the candidacy of Senator Weeks of Massachusetts, who has a summer home in the northern part of the State. The Progressives sent a full delegation to the national convention of that party.

The State-wide primary for the nomination of candidates for the November election was held the first Tuesday in September. This was preceded by spirited contests, particularly for the gubernatorial nominations. Henry W. Keyes of Haverhill on the Republican side won over Rosecrans W. Pillsbury of Londonderry. Both can-

didates conducted a speaking campaign, visiting practically every town in the State. It was the fourth campaign that Pillsbury had waged for the nomination, each time in face of the opposition of the so-called party "organization." The vote was: Keyes, 12,724; Pillsbury, 9683, about 50 per cent of the party vote at the November election being cast.

On the Democratic side, the same candidates contested as in the 1914 campaign, Albert W. Noone of Peterborough and John C. Hutchins of Stratford, the former winning that contest by a plurality of only two votes. In the 1916 contest, the result was reversed, Hutchins receiving a vote of 4855 and Noone, 2979.

There was also a lively contest for the Republican nomination for Congress in the first district where Cyrus A. Sulloway sought a renomination for the eleventh consecutive time. The other contestants were the Rev. Thomas Chalmers, pastor of the First Congregational Church of Manchester, and O. L. Haselton of Manchester, president of the State Senate. Sulloway won by a pronounced plurality. The Progressive party, whose vote at earlier elections had been amply large to win for it a legal standing as a party, made no rival nominations, but for the most part designated the same candidates as the Republicans. This action gave the Republican campaign managers increased confidence for their general ticket, but they nevertheless conducted the liveliest campaign that the State had witnessed in many years. There were no clear-cut local issues between the parties, the campaign being waged on national issues, principally the course of the administration as to Mexican and foreign belligerent affairs.

The Republicans won the State election, by a reduced margin, as compared with previous years, but its candidates for presidential electors were defeated by about 50 votes. The vote for electors was: Wilson and Marshall, 43,871; Hughes and Fairbanks, 43,725; for all others, 1621. The vote for Governor was: Keyes, Republican and Progressive, 45,899; Hutchins, Democrat, 38,853; for all others, 1490. The vote for Keyes under the Progressive party emblem was 48. As the law requires 3 per cent of the total, the result removes the Progressive party from the list of regular political parties in New Hampshire.

Of the five members of the Governor's council, four Republicans and one Democrat were chosen, a gain of one for the Democratic party.

Of the 24 Senators, the Republicans elected 16 and the Democrats 8, a Democratic gain of 4. The House of Representatives will have a Republican plurality of about 70, a loss of about 50.

At the November election, the question of the expediency of calling a convention to revise the constitution was submitted. The vote was favorable, resulting: yes, 21,589; no, 14,520. The Legislature of 1917 will make provision for such convention and it will probably be assembled next June. The last convention of the sort was held in June, 1912, and previous to that, in December, 1902. The pressing questions are a revision of the provisions as to the taxation of money at interest, and growing timber, and for a reduction in the size of the House of Representatives, there now being a membership of 420.

The United States government in January

purchased under the Weeks Forestry Act, a tract of 5500 acres in the White Mountains. This tract will be added to the lands already acquired and set apart as a public reservation. It is situated on the slope of the Presidential Range and includes the summit of Mount Webster, Mount Jackson, and Mount Clinton. This purchase gives to the government control of practically all the peaks of the Presidential Range, or brings its holdings in New Hampshire up to more than 270,000 acres.

**STATE OFFICERS.** Governor, Henry W. Keyes, Rep.; Secretary of State, Edwin C. Bean, Rep.; Treasurer, John W. Plummer, Rep.; Adjutant-General, Charles W. Howard, Rep.; Attorney-General, J. P. Tuttle, Rep.; Superintendent of Public Instruction, Henry C. Morrison, Dem.; Commissioner of Insurance, R. J. Merrill, Prog.

**JUDICIARY.** Supreme Court: Chief Justice, Frank N. Parsons; Associate Justices, Reuben E. Walker, John E. Young, Robert J. Peaslee, William A. Plummer; Clerk, Arthur C. Chase.

**STATE LEGISLATURE:**

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Republicans .....	18	240	258
Democrats .....	8	160	168
Republican majority..	8	80	88

**NEW HAMPSHIRE COLLEGE.** A co-educational State institution at Durham, N. H., founded in 1866. In 1916 there were 653 students and 63 faculty members. The college has productive funds amounting to \$1,000,000 and in 1916 drew an income from all sources of \$250,000. The library contains 32,000 volumes. President, Edward Thomson Fairchild.

**NEW HEBRIDES.** A group of Melanesian islands jointly administered by France and Great Britain through the French and British high commissioners for the Pacific. There are resident commissioners. Estimated area, 5100 square miles; estimated population, 70,000. Vila, in the island of Efate, is the seat of government. A large proportion of the natives are cannibals.

**NEW JERSEY. POPULATION.** The population of the State on Dec. 31, 1916, was 2,981,105. The population of the State in 1910 was 2,537,167.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

	<i>Acreage</i>	<i>Prod. Bu.</i>	<i>Value</i>
Corn .....	1916 370,000	10,800,000	\$10,800,000
	1915 285,000	10,830,000	8,122,000
Wheat .....	1916 90,000	1,800,000	2,952,000
	1915 78,000	1,560,000	1,654,000
Oats .....	1916 69,000	2,070,000	1,268,000
	1915 70,000	2,275,000	1,092,000
Potatoes .....	1916 85,000	10,370,000	16,074,000
	1915 93,000	12,090,000	9,068,000
Hay .....	1916 375,000	585,000	10,296,000
	1915 361,000	523,000	9,937,000
Rye .....	1916 70,000	1,330,000	1,556,000
	1915 71,000	1,420,000	1,306,000

*a* Tons.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned in December, 1916, disclosed the

following comparative condition of manufactures in 1909 and 1914:

	<i>1909</i>	<i>1914</i>
Number of establishments	8,817	9,742
Average number of wage earners .....	826,223	873,605
Capital invested .....	\$977,172,000	\$1,352,382,000
Wages .....	169,710,000	211,136,000
The value of materials used	720,034,000	883,465,000
The value of products...	1,145,529,000	1,406,683,000

**MINERAL PRODUCTION.** The production of iron ore in the State in 1915 was 415,234 gross tons, compared with 350,135 tons in 1914. The total shipments from the mines of the State in 1915 were 391,215 tons, valued at \$1,140,040, compared with 346,830 tons, valued at \$1,076,208, in 1914.

**TRANSPORTATION.** The total track mileage of the railroads in the State on Jan. 1, 1916, was 5889. The railways having the longest mileage are the Pennsylvania, 1129; the Central Railroad of New Jersey, 1129; the Delaware, Lackawanna, and Western, 696; the Lehigh Valley, 494; the Erie, 478.

**EDUCATION.** The total enrollment in the public schools of the State in 1916 was 540,287. The average daily attendance was 421,884. There were 16,741 teachers, who received an average yearly salary of \$372.

**FINANCE.** The gross receipts for the fiscal year ending Oct. 31, 1916, amounted to \$12,917,658, and the disbursements to \$11,297,103. There was a balance on Oct. 31, 1915, of \$2,457,687, and on Oct. 31, 1916, of \$4,078,242.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions under the control of the State department of charities and corrections include the State Hospital at Morris Plains, New Jersey State Village for Epileptics at Skillman, State Home for Feeble-Minded at Vineland, Sanatorium for Tuberculosis at Glen Gardner, New Jersey State Prison at Trenton, New Jersey Reformatory at Rahway, New Jersey State Reformatory at Clinton, New Jersey State Home for Boys at Jamesburg, New Jersey State Home for Girls at Trenton, New Jersey Home for Disabled Soldiers at Kearny, New Jersey Home for Disabled Soldiers and Sailors and their Wives or Widows at Vineland. During the year the State took over what was known as the Burlington Colony for the Feeble-Minded, and is now known as the State Colony for Feeble-Minded Males. There were in this colony, at the end of the year, 43 boys.

**LEGISLATION.** The State Legislature met in 1916 and enacted many important measures. A record of these is given below:

Procedures in courts were amended. A budget system was established requiring the Governor to make his recommended appropriations on the basis of estimates submitted by the departments; all appropriations are required to appear in the general appropriations bill. A central purchasing agency controlled by a commission consisting of the Governor, Treasurer, and Comptroller was created. This agency is to purchase all supplies for State departments and office, except for construction work. The municipal construction, ownership, and operation or lease of docks, warehouses, or shipping facilities are authorized. The State is divided into two water districts and a water supply commission created to act for each. A commission

was created to study the operation of civil service laws in the State and its municipalities. The election laws were amended. Registration in person or by an affidavit is required in municipalities of more than 10,000. A commission of laws was created, to revise and codify statutes relating to municipalities. Appropriations were made for vocational education. A State department of agriculture was created. The question of the creation of a highway commission was referred to the voters of the State. The office of commissioner of motor vehicles was created. A workmen's compensation aid bureau was created in the labor department with the duty of observing the operation of a compensation law and assisting employees in recovering their full compensation. The laws relating to insurance were amended, as were also the laws relating to banks and banking. Provision was made for the regulation of "jitneys."

A new law went into effect on July 1st, providing that articles of food which had been held in cold storage for 30 days or more should not be advertised or represented as fresh, but should be marked cold storage. The law required also that cold storage should be licensed by the State Department of Health. They must also make monthly reports to this department, instead of quarterly reports as heretofore.

**POLITICS AND GOVERNMENT.** The New Jersey political campaign of 1916 had unusual interest from the fact that the State was the home of President Wilson. The months preceding election he lived at Long Branch. In neither party was there a contest over the election of delegates to the respective national conventions, but in the primary campaign for the nomination of candidates there was a keen struggle for both the governorship and the United States senatorial nomination in the Republican ranks, and for the senatorship only on the Democratic side.

The Republican candidates for Governor were Walter E. Edge of Atlantic County, Austen Colgate of Essex, and George L. Record of Hudson. The last named, who ran on a platform of local option, home rule, public ownership of public utilities, and exemption of buildings and improvements from taxation, was one of the original leaders of the Progressive party in the State. Both Edge and Colgate were members of the State Senate and both were pledged to give the State an efficient and business-like administration. For United States Senator the Republican candidates were Franklin Murphy of Essex, a former Governor and a member of the Republican national committee, and Joseph S. Frelinghuysen of Somerset, president of the State board of agriculture and of the State board of education. Edge won the governorship nomination by 3611 and Frelinghuysen the senatorial nomination by 7877.

H. Otto Wittpenn of Hudson, naval officer of the port of New York and a former mayor of Jersey City, was the unopposed Democratic candidate for Governor. United States Senator James E. Martine was a candidate for renomination and was opposed by Atty.-Gen. John W. Wescott, who at Baltimore in 1912 and at St. Louis in 1916 had made speeches on behalf of the Jersey delegation, placing Woodrow Wilson in nomination. It was generally

believed that administration sympathy was with Mr. Wescott. Martine won by 21,334.

Both parties made energetic campaigns previous to the November election. The Republicans laid great stress on their view of the need of a higher tariff. The vote was: Hughes, 268,982; Wilson, 211,018; plurality for Hughes, 57,964. The Socialist ticket received 10,405 votes; Prohibition, 3182; Socialist-Labor, 855. For United States Senator Frelinghuysen polled 244,715; Martine, 170,019. For Governor, Edge received 247,343; Wittpenn, 177,696.

The Republicans elected 10 of the 12 representatives in Congress, a gain of 2, and carried both branches of the Legislature, having a majority of 37 on joint ballot. The Senate stands 15 Republicans to 6 Democrats, and the Assembly 44 Republicans to 16 Democrats.

**STATE OFFICERS.** Governor, Walter E. Edge, Rep.; Secretary of State, Thomas F. Martin, Dem.; Treasurer, William T. Read, Rep.; Comptroller, Edward I. Edwards, Dem.; Attorney-General, John W. Wescott, Dem.; Commissioner of Education, Calvin N. Kendall, Dem.; Commissioner of Insurance, G. M. La Monte, Dem.

**JUDICIARY.** Court of Errors and Appeals: Chancellor, Edwin Robert Walker; Chief Justice of the Supreme Court, William S. Gummere; Justices, Charles G. Garrison, Francis J. Swayze, Thomas W. Trenchard, Charles W. Parker, James J. Bergen, James F. Minturn, Samuel Kalisch, Charles C. Black; Lay Judges, John Josiah White, Henry S. Terhune, Ernest J. Heppenheimer, Robert Williams, Frank M. Taylor, and Walter P. Gardner.

**STATE LEGISLATURE:**

	Senate	House	Joint Ballot
Republicans .....	15	44	59
Democrats .....	6	16	22
Republican majority..	9	28	37

**NEW MEXICO. POPULATION.** The population of the State on Dec. 31, 1916, was 416,966. The population in 1910 was 327,301.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

		Acreage	Prod. Bu.	Value
Corn .....	1916	125,000	2,625,000	\$2,966,000
	1915	105,000	2,780,000	1,993,000
Wheat .....	1916	113,000	2,104,000	3,156,000
	1915	89,000	1,976,000	1,779,000
Oats .....	1916	64,000	1,856,000	1,244,000
	1915	60,000	2,180,000	1,080,000
Barley .....	1916	11,000	308,000	308,000
	1915	8,000	264,000	185,000
Potatoes .....	1916	8,000	816,000	1,428,000
	1915	8,000	800,000	760,000
Hay .....	1916	185,000	370,000	5,180,000
	1915	201,000	442,000	3,890,000

a Tons.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments.....	818	868
Average number of wage earners	4,148	3,776

	1909	1914
Capital invested .....	\$7,748,000	\$8,984,000
Wages .....	2,591,000	2,695,000
The value of materials used ....	3,261,000	4,480,000
The value of products .....	7,898,000	9,820,000

**MINERAL PRODUCTION.** The output of the State in 1915, according to the United States Geological Survey, was valued at more than \$19,000,000. The gold production was valued at \$1,461,005. There were 2,500,531 ounces of silver, 76,788,366 pounds of copper, 4,542,361 pounds of lead, and 25,405,064 pounds of zinc. These figures indicate an increase of \$289,308 in gold, 228,068 ounces of silver, 17,480,441 pounds of copper, 2,778,725 pounds of lead, and 7,000,672 pounds of zinc. The value of the metals except silver was higher than 1914. The total was \$19,279,368, compared with \$11,049,932 in 1914.

The output of metal in the State in 1916 is estimated by the United States Geological Survey as follows: gold, \$1,350,000, silver 1,800,000 ounces, lead 7,100,000 pounds, copper 91,400,000 pounds, zinc 36,500,000 pounds. These figures showed decreases of \$111,105 in gold, 700,531 ounces of silver, but increases of \$167,596 in the value of the silver, 14,611,634 pounds in quantity and \$11,514,236 in the value of copper, 2,557,639 pounds in quantity and \$269,309 in value of lead, and 11,094,936 pounds in quantity and \$2,349,896 in the value of zinc. The total value of the five metals increased \$14,190,000, or nearly 74 per cent, in 1916.

The coal production of the State in 1916 was estimated at 4,570,000 tons, an increase of about 24 per cent over the production of 1914. The increase was due to the larger quantity of coal made into coke, and to the demand for railroad fuel. Except in November the supply of cars was ample, but there was a shortage of available labor. The market for coal from New Mexico was extended on the Pacific Coast, and to interior points that normally depend on water-borne coal.

**TRANSPORTATION.** The total railway mileage of the State is about 3000. There has been practically no construction in the last three years. The lines having the longest mileage are the Atchison, Topeka, and Santa Fe, 1194; El Paso and Southwestern, 625; the Denver and Rio Grande, 217.

**EDUCATION.** The total school population of the State in 1916 was 114,206. The total enrollment in the public schools was 75,736, with an average daily attendance of 68,147. The male teachers numbered 731, and females 1571, or 2302. The average salary of male teachers was \$535.79, and of women \$538.94. In March, 1916, New Mexico was embraced within the territory of the North Central Association of Colleges and Secondary Schools.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include the Insane Asylum at Las Vegas, the State Penitentiary at Santa Fe, the Reform School at Springer, the Miners' Hospital at Raton, and the Deaf and Dumb Asylum at Santa Fe.

**POLITICS AND GOVERNMENT.** The State Legislature did not meet in 1916. There was an election for United States Senator and for Governor. The election was extraordinarily close, in both local and national elections. E. C. De Baca, Democrat, was elected Governor by a vote

of 32,732 against 31,524 cast for H. C. Bursum, his Republican opponent. For United States Senator A. A. Jones, Democrat, received 33,982 votes, as against 30,609 cast for Frank A. Hubbell, Republican candidate. At the national election Wilson received 33,527 votes, and Hughes 31,152. The Socialists cast 2033 votes for United States Senator, and 1999 for Benson, their candidate for President.

On May 13th work was completed on the Elephant Butte dam. By damming the Rio Grande River there was formed what is said to be the greatest storage reservoir in the world. The dam has taken five years to build. It is the work of the United States Reclamation Service. The reservoir feeds an irrigation system covering 185,000 acres of land in New Mexico, Texas, and Mexico. The dam is thrown across canyons of the Rio Grande River 1210 miles north of El Paso. It stores the entire flow and flood of the river, and holds when full 115,000,000,000 cubic feet of water. The dam is 318 feet high and 1674 feet long. Across its top runs a road 16 feet wide. The base of the dam is 235 feet thick. The territory irrigated by the reservoir lies in four valleys, for each of which there are a diversion dam and main canals. Twenty-five thousand acres of the land are on the Mexican side of the river. Before beginning construction work the government laid out a town equipped with all modern conveniences and in this there were at times as many as 4000 people, whose government was entirely under the jurisdiction of the engineers. The railroad was constructed through 13 miles of rough country to connect the camp with the main line railroad.

**STATE OFFICERS.** Governor, E. C. De Baca, Dem.; Lieutenant-Governor, W. E. Lindsey, Rep.; Secretary of State, Antonio Lucero, Dem.; Treasurer, H. L. Hall, Dem.; Auditor, W. G. Sargent, Rep.; Adjutant-General, Harry T. Herring, Dem.; Attorney-General, Harry L. Patton, Dem.; Superintendent of Public Instruction, John H. Wagner, Rep.; Commissioner of Insurance, Jacobo Chavez, Rep.

**JUDICIARY.** Supreme Court: Chief Justice, R. H. Hanna; Associate Justices, Clarence J. Roberts and Frank W. Parker; Clerk, José D. Sena.

**STATE LEGISLATURE:**

	Senate	House	Joint Ballot
Republicans .....	14	29	43
Democrats .....	10	20	30
Republican majority..	4	9	13

**NEW ORLEANS OPERA HOUSE.** See MUSIC, *General News*.

**NEW SOUTH WALES.** A southeastern state of the Commonwealth of Australia. It is bounded on the north by Queensland, on the east by the Pacific Ocean, on the south by Victoria, and on the west by South Australia. The estimated area is 309,460 square miles, which is slightly more than one-tenth the area of the Commonwealth. The population, according to the 1911 census, was 1,646,734 (857,698 males, 789,036 females), exclusive of full-blooded aboriginals. The increase per cent in the decade 1901-11 was 21.67, in 1891-1901 20.54, in 1881-91 49.90. Estimated population June 30, 1915, 1,868,656. The capital is Sydney, the largest

Australian city; its population at the 1911 census was 112,921; including suburbs, 629,503; estimate at end of 1914, 752,500.

The official report of the New South Wales Railways and Tramways Commission showed a deficit for the year ending June 30, 1916, of \$668,934. The deficit of the railways was \$1,088,874, but was in part offset by a profit of \$419,940, made from the tramways. In 1914-15 the profit for the combined services amounted to \$325,102. During the fiscal year 1915-16, 292,021,774 passengers were carried on the tram lines, as compared with 289,282,845 in 1914-15; the steam railways carried 92,850,838 passengers, against 88,774,451. No passengers were fatally injured by accident to trains.

The executive authority rests with a governor, who is appointed by the Crown and is assisted by a responsible ministry. The Parliament consists of the legislative council and the legislative assembly. Members of the council are not less than 21 in number (56 in 1914), and are appointed by the Crown for life; members of the assembly number 90, elected by universal suffrage. The maximum duration of a parliament is three years. The governor in 1916 (from March 14, 1913) was Sir Gerald Strickland, Count della Catena, G. C. M. G.; premier and treasurer, William Arthur Holman. See AUSTRALIA.

**NEW YORK. POPULATION.** The population of the State on Dec. 31, 1916, was 10,366,778. The population in 1910 was 9,113,614.

	1916	1915	1914
Rye	151,000	150,000	151,000
Barley	81,000	81,000	85,000
	2,718,000	2,805,000	2,720,000
	\$3,479,000	2,609,000	1,906,000
		1,887,000	2,040,000

a Tons. b Pounds.

**MINERAL PRODUCTION.** New York ranks fifth among the States in the production of iron ore, being surpassed only by Minnesota, Michigan, Alabama, and Wisconsin. The total production in 1915 was 998,845 gross tons, compared with 785,377 tons in 1914. There were shipped from the mines in the State in 1915, 931,745 tons, valued at \$2,797,270, compared with 640,252 tons, valued at \$1,992,892, in 1914.

There were produced in the State in 1915 887,778 barrels of petroleum, compared with a production of 938,974 barrels in 1914.

**MANUFACTURES.** The census for manufactures for 1914 showed a consistent increase as compared with that of 1909. The capital invested in 1914 was \$3,334,278,000, an increase of \$554,781,000, or 20 per cent over 1909. The value of the production was \$3,814,661,000, compared with \$3,369,490,000 in 1909, an increase of 13.2 per cent. The number of wage earners employed during the year was 1,057,857, compared with 1,003,981 in 1909, or an increase of 5.4 per cent. The most important facts in relation to the census for 1914 as compared with that of 1909 are shown in the following table:

	Census—		Per cent of increase 1909-1914
	1914	1909	
Number of establishments	48,203	44,935	7.3
Persons engaged in manufactures	1,289,098	1,208,241	7.1
Proprietors and firm members	48,636	47,569	2.2
Salaried employees	182,605	151,691	20.4
Wage earners (average number)	1,057,857	1,003,981	5.4
Wage earners, by months—			
January	1,055,575	945,856	...
February	1,078,854	971,286	...
March	1,094,773	991,683	...
April	1,084,215	989,498	...
May	1,067,080	983,987	...
June	1,058,471	980,503	...
July	1,038,953	977,203	...
August	1,037,475	998,896	...
September	1,067,384	1,041,338	...
October	1,072,512	1,068,162	...
November	1,034,649	1,059,852	...
December	1,014,893	1,045,110	...
Primary horsepower	2,856,655	1,997,662	18.0
Capital	\$3,334,278,000	\$2,779,497,000	20.0
Services	873,771,000	743,263,000	17.6
Salaries	242,729,000	186,032,000	30.5
Wages	631,042,000	557,231,000	13.2
Materials	2,108,607,000	1,856,904,000	13.6
Value of products	3,814,661,000	3,369,490,000	13.2
Value added by manufacture (value of products less cost of materials)	1,706,054,000	1,512,586,000	12.8

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

	1916	1915	1914
Corn	540,000	605,000	450,000
Wheat	450,000	475,000	1,206,000
Oats	1,206,000	1,340,000	820,000
Potatoes	820,000	855,000	4,500,000
Hay	4,500,000	4,225,000	3,700
Tobacco	3,700	4,400	
	16,200,000	24,200,000	9,030,000
	18,876,000	15,170,000	11,994,000
	19,441,000	24,422,000	85,392,000
	18,048,000	86,751,000	86,224,000
	592,000	5,280,000	502,000

**TRANSPORTATION.** The total steam railroad mileage of the State on June 30, 1916, was 98,458. The roads having the longest mileage were the New York Central, 2820; the Erie, 950; Delaware and Hudson, 724; and the Lehigh Valley, 659.

**EDUCATION.** The total school population of the State in 1914-15 was 2,306,142. The total enrollment in the public schools was 1,579,040. There was an average daily attendance of 1,288,047. During the year 46,140 female teachers and 5775 male teachers were employed. The average yearly salary of all teachers in the State was \$975.13. The Legislature of 1916 enacted a physical training law, which is con-



sidered one of the most important movements in education ever undertaken. This law provides that all children in attendance in public or private schools between the ages of 8 and 16 shall receive a certain amount of physical training each year. The law makes it a duty of the board of regents to prescribe a syllabus, outlining the work to be given in physical training, and also gives that body the discretion to determine the maximum amount which shall be given each year. The president of the university has charge of the enforcement of this law. Under the provision of this statute President Finley, of the board of regents, promulgated in the latter part of the year a comprehensive scheme of health education, to be put into operation in every school of the State. The department also engaged in a movement for the improvement of rural schools. A campaign was inaugurated for the consolidation of such schools, so as to bring sufficient pupils into one school to properly grade the school, and to provide advanced instruction for such pupils. This movement also brings sufficient property to the support of one school to enable that school to provide trained teachers and to adopt courses of study, which are adapted to the needs and conditions of rural life. Several hundred consolidations were made during the year.

**FINANCE.** The receipts from all sources for the fiscal year ending June 30, 1916, amounted to \$105,040,958, and the disbursements to \$91,352,054. There was a balance at the beginning of the fiscal year of \$28,235,768, and at the end of \$41,924,672. The bonded debt of the State at the end of the year was \$211,404,660.

**CHARITIES AND CORRECTIONS.** For information on charities and corrections in New York see articles on CHARITIES, PENOLOGY, ETC.

**POLITICS AND GOVERNMENT.** Governor Whitman's message to the Legislature, sent on January 5th, contained a number of important recommendations. These included the centring of financial authority, audit, and responsibility with the comptroller, making him practically as important an official as the Governor. He also advocated the inauguration of a budget system, which would compel the Legislature to give detailed reasons for every appropriation in advance. He advised the substitution of serial bonds for long term improvement bonds, and a correction in the sinking funds methods. He urged the abolition of all special funds and the substitution for them of three days' sinking funds contributions, the proceeds from the State manufactured products, and a general fund for all current State expenses. He favored also the abolition of port wardens, and the health officers of New York City, and for transfer of their functions to the Federal government. He urged also the abandonment and discontinuance of several other institutions, and recommended the erection of a new hospital at Middletown, for the segregation of the aged insane.

On March 14th the Assembly passed the Whitney-Brereton resolution providing for the submission of the woman suffrage question again in 1917. The vote was 109 to 30. The Senate passed the measure on April 10th by a vote of 33 to 10. Favorable action by the Legislature of 1917 will insure a referendum question in that year. The political campaign in the State began at the informal convention held by the Republicans the first week in February. Al-

though no presidential candidate was endorsed, the delegates expressed their preference for Elihu Root. Mr. Root, as temporary chairman, delivered a remarkable address, in which he severely criticised the policies of President Wilson. This marked the actual beginning of the presidential campaign, and is given at considerable length in the article UNITED STATES, *Presidential Campaign*. Governor Whitman was a candidate for renomination for Governor on the Republican ticket, and Samuel Seabury, a judge of the Court of Appeals, was the Democratic candidate. While Judge Seabury had the formal support of the Tammany Hall organization of New York City, it was not particularly enthusiastic for him as a candidate.

A rather remarkable situation developed in the Republican candidacy for United States senator. Senator Root was not a candidate for renomination, and the only active candidate up to within a few days of the primary was William M. Calder, a Representative in Congress. A few weeks prior to the nominating primary, Robert Bacon, formerly Secretary of State, and ambassador to France, decided to become a candidate, and had his name placed by petition on the primary ballot. The Democratic candidates for the nomination were William McCombs and Thomas F. Conway, formerly lieutenant-governor of the State. The primaries were held on September 19th. Governor Whitman was nominated over William Bennett, and Mr. Calder defeated Robert Bacon by a comparatively narrow margin of votes. Mr. Seabury was unopposed in the primary vote for Governor, and Mr. McCombs defeated Mr. Conway for the nomination for United States senator. The campaign following the nominations was a very severe one, as New York was considered to be a doubtful State. It was thought to be the pivotal State in the presidential election. Both Mr. Whitman and Mr. Seabury made active personal campaigns throughout the State. Mr. Whitman made the first issue the defense of his administration, while Judge Seabury assailed his administration as extravagant and incompetent. In the election on November 7th Governor Whitman received 834,360 votes, as against 684,763 for Judge Seabury. For United States senator Mr. Calder received 836,298 against 603,601 for Mr. McCombs. For President, Mr. Hughes carried the State with a vote of 863,841, compared with 756,946 for Mr. Wilson. Two propositions were voted upon, one the question of a convention to revise the constitution. This was defeated by a vote of 656,067 to 504,250. The second proposition was for an act making provision for issuing bonds to the amount not to exceed \$10,000,000 for the acquisition of lands for State park purposes and providing for the submission of the plan to the people to be voted upon at the general election. This was approved by a vote of 650,212 to 499,899.

**NEW YORK CITY.** The Thompson legislative committee appointed in 1915 to examine subway construction in its relation to public service corporations and equipment concerns began hearings in New York City on January 3rd. During the hearings many startling facts regarding payment of large sums of money out of appropriations for subways to officials of subway construction companies and others were divulged. During May the attention of the committee was occupied with investigating wire-tapping by the

police, in which Mayor Mitchel, J. P. Morgan and Company, and a number of Catholic charities were involved. (See CHARITIES.) It was brought out that the police, by authority of the mayor, had tapped certain telephone wires in order to secure information to be used in criminal prosecutions. Other cases of wire-tapping made with the object of discovering, if possible, the relations of certain firms to German agents in this country were also revealed. The grand jury found indictments against a number of persons for illegally tapping the telephone wires of the Rev. William B. Farrell, Dr. Daniel C. Potter, and his son, Dean Potter. On June 14th Mayor Mitchel submitted to the district attorney evidence in which he had charged that Monsignor Dunn, chancellor of the diocese of New York, Father William B. Farrell, and Dr. D. C. Potter had entered into a conspiracy against his administration. The committee continued its investigation into subway matters, and other lines until July 1st. Investigations on the charges of wire-tapping were continued by the district attorney and on September 15th all concerned in the wire-tapping cases were exonerated, and all conspiracy, libel, and perjury charges made by Mayor Mitchel's administration against the Catholic officials were dismissed.

A plan for zoning the city made by real estate experts and engineers was reported on March 13th, and hearings were begun on March 27th. The plan was finally adopted. (See CITY PLANNING.) There were a number of serious strikes in the city during the year. (For an account of these, see the article STRIKES.) The epidemic of infantile paralysis throughout the summer resulted in the death of several thousand persons. See POLIOMYELITIS.

Several investigations were carried on throughout the latter part of the year in order to determine if possible the causes of high prices of certain food commodities. Especial attention was paid to the subject of milk, caused by the action of nearly all the larger milk distributing companies in raising the price of milk. See PRICES.

**LEGISLATION.** The Legislature met in 1916 and passed many important measures. A record of these follows:

The laws regulating the practice of law were amended, and the civil code was amended in several particulars. The charitable institutions in Westchester County were reorganized under the management of the commissioners of charities and corrections. The commission on new prisons was also organized for the selection of a new prison site and a farm and industrial prison, to cost \$1,250,000. Civil War veterans employed for 10 years in the State's service who have reached the age of 70 may apply for retirement at half pay not exceeding \$1000. The institute for public service was incorporated to conduct a training school to prepare men for the public service by doing field work in coöperation with public officials. A military training commission was also created to coöperate with the State Board of Regents in devising school courses and physical training, and to give military training for not more than three hours a week during the academic year. Other changes were made in the laws of military and naval affairs. The employment in making motion picture films of children under 16 years of age was forbidden without the consent of a designated

local officer. It was made a misdemeanor for steam or electric railroads to employ in the operation of trains an engineer or fireman who is unable to read or understand the English language, or to see or understand signals. The workmen's compensation law was extended in its operation. Provision was made for the annulment of marriages when one or both parties have not attained the age under which the consent of parent or guardian is required by the laws of the State where the marriage was contracted. Other changes were made in the laws relating to marriage. The agricultural law was amended in important particulars.

**STATE OFFICERS.** Governor, Charles S. Whitman; Lieutenant-Governor, Edward Schoeneck; Secretary of State, Francis M. Hugo; Comptroller, Eugene M. Travis; State Treasurer, James L. Wells; Attorney-General, Egbert E. Woodbury; State Engineer and Surveyor, Frank M. Williams; Superintendent of Insurance, Jesse S. Phillips; Superintendent of Banking, E. L. Richards; Superintendent of Prisons, James M. Carter; Superintendent of Public Works, W. W. Wotherspoon; Commissioner of Education, John S. Finley—all Republicans.

**JUDICIARY.** Court of Appeals: Frank H. Hitchcock, Chief Judge; Associate Judges, William H. Cuddeback, John W. Hogan, Frederick Collin, Cuthbert W. Pound, Emery A. Chase, Benjamin N. Cardozo.

**STATE LEGISLATURE.** The Legislature of 1916 is composed of 36 Republicans and 15 Democrats in the Senate, 99 Republicans, 49 Democrats, and 2 Socialists in the Assembly. In both bodies the Republicans have 125 members, the Democrats 54, and the Socialists 2.

**NEW YORK, COLLEGE OF THE CITY OF.** A municipal institution for the education of men in New York City. In the fall of 1916 there were 2044 students in the day session of the college, 2726 in the evening session, 1416 in the day session of the preparatory department, and 3000 in extension courses. Besides instructors and tutors the faculty numbered 75. Dr. Camillo von Klenze, of Brown University, was appointed professor of German. For the year 1916 the city appropriated a budget of \$696,119 for the use of the college. The library contains 66,000 volumes. During the year, Mr. George McAneny was appointed a member of the board of trustees, and subsequently was elected chairman of the board. By amendment to the city charter, the college was authorized to offer gratuitously or otherwise, to men and women in New York, courses in vocational subjects and civic administration. President, Sidney Edward Mezes.

**NEW YORK BARGE CANAL.** See CANALS.

**NEW YORK CITY.** See ARCHITECTURE; BUILDING OPERATIONS; CHARITIES; CITY PLANNING; NEW YORK, section *New York City*

**NEW YORK, NEW HAVEN, AND HARTFORD RAILROAD.** See TRUSTS.

**NEW YORK PHILHARMONIC SOCIETY.** See MUSIC, *Orchestras*.

**NEW YORK SYMPHONY SOCIETY.** See MUSIC, *Novelties*.

**NEW YORK UNIVERSITY.** A non-sectarian educational institution in New York City, founded in 1831. In some departments it is co-educational. In the fall of 1916 there were 7797 students and 465 faculty members. The

productive funds amounted to \$1,394,657 and the total income to \$720,343. During the year Dr. Samuel A. Brown was appointed dean of the university and Bellevue Hospital Medical College. A new course in diplomacy was established and the Wall Street branch of the university moved into new quarters. The library contains 129,200 volumes. Chancellor, Elmer Ellsworth Brown.

**NEW ZEALAND, DOMINION OF.** An autonomous British dependency, composed of three principal and four smaller southern Pacific islands, with annexed groups of small islands and islets, many practically useless for settlement. The table below shows area, European population for comparative years, and Maori population, 1911 census:

	Sq. miles	Pop. 1901	Pop. 1911	Maoris
North Island.....	44,468	890,571	568,729	46,632
South Island.....	58,525	381,661	444,120	2,681
Stewart Island....	665	272	357	63
Total N. Z.....	103,658	772,504	1,008,206	49,376
Chatham Islands..	375	207	258	219
Kermadec Islands.	13	8	4	249*
Total .....	104,046	772,719	1,008,468	49,844

\* Maori wives of Europeans (enumerated in European census) scattered among the various islands.

Total area inclusive of outlying islands (with the Cook and other groups), 104,751 square miles. The total population in 1881 was 489,933, exclusive of Maoris; 1871, 256,393; 1861, 99,021; 1858, 59,413. In 1911 the rural population numbered 496,779, or 49.26 per cent of the total; the borough population, 505,598, or 50.14 per cent. In the rural population are included inhabitants of towns not constituted municipal boroughs, while with the urban population are classed persons in outlying districts who frequently follow agriculture pursuits. Remaining population is accounted for by number of persons on shipboard, railways, and in adjacent islands not included in any country or borough. The city of Auckland had (1911) 40,536 inhabitants, 102,676 with suburbs; Wellington (the capital), 64,372 and 70,729; Christchurch, 53,116 and 80,193; Dunedin, 41,529 and 64,237; Invercargill, 12,782 and 15,858; Wanganui, 10,929 and 14,702; Napier, 10,537 and 11,736; Timaru, 11,280; Palmerston North, 10,991; Gisborne, 8196.

Of the total population (1911) of all races (1,058,312), 558,385 were males, 499,927 females. Population of Cook and other annexed Pacific islands, 12,598 (6449 males and 6149 females). Total population of New Zealand proper (North, South, and Stewart islands), the dependencies (Chatham and Kermadec groups), and of Cook and other annexed Pacific islands, 1,070,910; average per square mile, 9690 (7427 in 1901; 4693 in 1881; 1641 in 1864). Protestants are greatly in the majority and of these the predominant church is the Church of England, with 413,842 adherents (or 41.14 per cent of the whole), the Presbyterian next, with 234,662.

Persons classed as actively engaged in agricultural pursuits numbered 130,581 (exclusive of dependents); among these are included those occupied in mines and quarries 14,775, and in fisheries 925; in pastoral pursuits 55,287; in

soil cultivation, etc., 54,738; in forestry, or the acquisition of raw products yielded by natural vegetation, 3376; in water-conservation, 389. Persons actively engaged in industrial pursuits, 133,555; commercial, 65,762; domestic, 44,267; transport and communications, 36,433; professional, 32,716; various, 10,803; not stated, 300. Non-breadwinners (dependent wives and children, etc., and persons supported by public or private charity), 554,051.

**PRODUCTION.** The climate is temperate and very healthful, the average death rate being less than 10 per 1000. The temperature is more equable than in the British Isles. While the summers are as cool as those of England, the winters are as warm as those of Italy. The mean annual temperature at Auckland (59°) is nearly the same as at Rome; at Wellington (56°) nearly the same as at Milan; at Dunedin (51°) nearly the same as at London. The extreme range of temperature at Wellington is 50° from 82° in summer to 32° in winter. The rainfall varies from a mean for the year of 25 inches on the east coast, to 116 inches on the west coast of the South Island; and from 37 inches on the east coast, to 59 inches on the west coast of the North Island.

The average birth rate for the 10 years 1905-14 was 26.71 per 1000 living, and the average death rate for the same period 9.51. The birth rate in 1914 was 25.99 per 1000, the death rate in that year was 9.31.

All the products of the temperate climates of Europe and Asia can be cultivated with success in New Zealand. There are extensive coal mines and rich gold fields. The gold entered for exportation from the Dominion up to Dec. 31, 1914, was valued at £82,953,910. The wool exported in 1914 amounted to 220,472,898 pounds, valued at £9,318,114. In 1855 it amounted to 1,772,344 pounds, valued at £93,104. The trade in frozen meat, which began in 1882 with an export of 15,244 cwt., valued at £19,339, had developed an export for 1889 of 656,822 cwt., valued at £783,374; in 1893 of 903,836 cwt., valued at £1,085,167; and in 1898, 1,551,773 cwt., valued at £1,698,750; in 1903, 2,378,650 cwt., valued at £3,197,043; in 1908, 2,120,303 cwt., valued at £3,188,515; in 1910, 2,654,196 cwt., valued at £3,850,777; in 1911, 2,250,565 cwt., valued at £3,503,406; in 1912, 2,573,238 cwt., valued at £3,909,569; in 1913, 2,578,693 cwt., valued at £4,449,933; and in 1914, 3,229,973 cwt., valued at £5,863,062. The live stock in New Zealand, as returned in 1911, were: horses, 404,284, against 99,859 in 1874; cattle, 2,020,171, against 494,917 in 1874; sheep (1916), 24,607,868, against 11,704,853 in 1874. The number of acres under crops in October, 1914, was 1,380,348, exclusive of 14,214,741 acres in sown grasses; 229,600 acres were in wheat having an estimate yield of 6,644,336 bushels; 287,561 acres were in oats, estimated yield 11,436,301 bushels.

**COMMERCE AND COMMUNICATIONS.** In the table below is shown the trade with the United Kingdom, the colonies, other countries, and totals for three years:

Imports:	1910	1911	1914
U. K. ....	£10,498,771	£11,787,800	£11,935,946
Colonies .....	8,967,053	4,710,040	5,868,838
Other .....	2,585,759	3,048,539	4,206,312
Total .....	£21,751,583	£19,546,379	£21,856,096

Exports:	1910	1911	1914
U. K. ....	£18,638,118	£15,134,743	£21,388,991
Colonies .....	2,468,119	2,966,952	2,724,965
Other .....	1,078,972	926,795	2,152,591
<b>Total</b> .....	<b>£22,180,209</b>	<b>£19,028,490</b>	<b>£26,261,447</b>

According to the newspaper reports in October both exports and imports reached record figures, the former being \$165,891,340, or a gain of 30 per cent over the year before, and the latter \$117,718,985, a gain of 26 per cent over the year before.

At the end of March, 1915, there were 2954 miles of government and 29 miles of private railways in operation in New Zealand, and 170 miles of government line under construction. The construction of new lines and the extension of existing ones is still steadily proceeding. The expenditure on the 2954 miles of government railways has been £33,909,340, or an average of £11,557 a mile. This includes all charges connected with the construction and equipment of the lines. The revenue from the government railways for the years 1914-15 was £4,105,457, and the working expenses £2,920,455. The gauge throughout is 3 ft. 6 in.

There were on March 31, 1916, 2970 miles of railway in New Zealand. The construction cost of these lines at the close of the fiscal year 1915-16 was \$181,691,167, with gross earnings for the year of \$22,134,574. The net profits were \$7,768,762. During the fiscal year 1915-16, \$4,750,843 was expended on improvements on the New Zealand government railways.

Of telegraphs and interurban telephone circuits there are 13,434 miles of land lines and 46,778 miles of wire, constructed at a cost of over £2,500,000. There are five submarine cables connecting the two islands of New Zealand; two, Wakapuaka-La Perouse; one, Auckland-Sydney; and one Auckland-Brisbane, via Norfolk Islands, connecting the Dominion with Australia.

**FINANCE, ETC.** In the table below are shown financial statistics for comparative years:

	1909-10 *	1911-12	1914-15
Revenue .....	29,288,917	211,032,544	212,451,945
Expenditure .....	8,990,922	10,340,368	12,876,803

\* Financial year ending March 31.

Gross public debt March 31, 1915, £100,059,910; accrued sinking fund, £3,178,055; net debt, £94,644,455.

A governor administers the Dominion.

**HISTORY.** The Prime Minister, Mr. Massey, paid a visit to England and in the middle of October, in the course of public addresses, referred to the problem of employment for discharged soldiers. New Zealand, he said, was already trying to deal with that difficult situation. He declared himself in sympathy with the movement for closer imperial relations, saying that he believed that this was desired in all outlying parts of the Empire. Mutual interests pointed to the necessity for closer and larger commercial relations. He also referred to the need of certain alterations in the constitutional system of the Empire in order to give the Dominion a voice in measures of defense and foreign policy. The attitude of the population toward enlistment had been shown in the preceding November when a national register showed that 110,000 men were ready to serve in the expeditionary forces if called upon, 43,500 to perform

non-military duties, and 34,386 unwilling to render any war service. The House of Representatives passed a military service bill in June by a vote of 44 to 4, establishing compulsory service. Measures for raising the necessary revenue included high additional taxation on land and incomes, and an increase of railway, postal, and telegraph rates and of customs duties.

**NICARAGUA.** A Central American republic, between Honduras on the north and Costa Rica on the south. On the east is the Caribbean Sea, and on the southwest the Pacific Ocean. The capital is Managua, situated on the southern shore of Lake Managua, in the western part of the republic.

**AREA, POPULATION, ETC.** Nicaragua is the largest of the Central American republics, having an estimated area of 128,340 square kilometers (49,552 square miles), which is about the size of the State of New York. The number of inhabitants is not known with accuracy, but in 1910 was estimated at about 600,000. An estimate reported for Dec. 31, 1914, is 703,540. The people, of whom probably three-fourths live in the western half of the country, are principally mestizo or Indian. The largest city is León, the former capital, with an estimated population of about 63,000. Managua is supposed to have about 40,000 inhabitants; Granada, 25,000; Matagalpa, 16,000; Bluefields, the chief eastern seaport and the centre of the banana trade, 15,000; Masaya, 15,000; Chinandega, 13,000. The chief Pacific port is Corinto.

The schools of Nicaragua have recently shown some progress, but illiteracy is general. The number of elementary schools is stated at 356. Ten "colleges" provide secondary education, and there are two so-called universities, one at León and one at Managua. Most of the people profess Roman Catholicism.

**PRODUCTION AND COMMERCE.** Nicaragua is capable of considerable agricultural development and it has valuable timber and mineral resources, but means of transport are inadequate, the inhabitants are lacking in industrial initiative, and unstable political conditions have discouraged foreign investments. Mining is almost limited to gold, which has contributed largely to the actual wealth of the country. There is some exploitation of dyewoods, mahogany, and cedar. The principal crops are bananas (in the Bluefields region), coffee (in the western districts), sugar cane, corn, and beans, while also of some importance are coconuts, rice, tobacco, cacao, and various fruits. Grazing, especially in the northwest, is a profitable industry; the number of cattle has been estimated at 1,200,000, though perhaps this figure is too large.

Imports and exports in 1915 were valued at \$3,159,220 and \$4,567,201 respectively, as compared with \$4,134,323 and \$4,995,050 in 1914. Valued in thousands of dollars, imports and exports have been as follows:

	1905	1910	1913	1913	1914	1915
Imports...	3,447	2,856	4,967	5,770	4,134	3,159
Exports...	3,542	4,545	3,862	7,712	4,955	4,567

Leading imports in 1913 and 1914 respectively, in thousands of dollars: cotton goods, 1417 and 828; iron and steel manufactures, 787 and 521; flour, 224 and 337; chemicals, drugs, and medicines, 232 and 200; hides and skins and manufactures thereof, 223 and 186; liquors and other

beverages, 239 and 141. In 1913, the export of coffee amounted to 111,929 metric quintals, valued at \$5,004,449; in 1914, 103,508 quintals, \$2,295,397. Next in value to the coffee export is that of gold, which amounted to \$891,025 in 1914, as compared with \$1,063,077 in 1913, \$907,134 in 1912, and \$931,938 in 1911. The banana export in 1913 was 1,393,026 bunches, valued at \$429,802; in 1914, 1,525,598 bunches, \$504,191. Other exports in 1913 and 1914 respectively, in thousands of dollars: woods (exclusive of dyewoods), 322 and 456; hides and skins, 327 and 401; rubber, 279 and 124; silver, 17 and 53; sugar, 32 and 47; cacao, 40 and 29; coconuts, 19 and 26.

Imports from the principal commercial countries, in thousands of dollars:

	1912	1913	1914	1915
United States .....	2,549	3,244	2,566	2,593
United Kingdom .....	989	1,151	718	802
France .....	256	401	254	138
Germany .....	604	619	392	37

Exports to these countries, in thousands of dollars:

	1912	1913	1914	1915
United States .....	1,767	2,722	2,428	3,080
France .....	626	1,763	1,156	601
United Kingdom .....	515	999	367	439
Germany .....	702	1,888	561	....

In 1914, imports and exports by principal ports were as follows, in thousands of dollars: Corinto, 2567 and 3247; Bluefields, 969 and 1062; San Juan del Sur, 306 and 149; Cabo Gracias, 207 and 335.

**COMMUNICATIONS.** Nicaragua has few good roads and (except about 20 miles of private railway) only one railway, in the western part of the country. The railway extends from Corinto to Chinandega, León, Managua, Masaya, Granada, and Diriamba. It is a 3 ft. 6 in. gauge line whose total length, with short branches, is 171 miles. It is owned by the state but leased to a New York company. Several new lines have been projected. On June 17, 1916, a contract was ratified by the Congress for a railway to connect the existing line with the Caribbean coast, the work to be completed within four years. Granada, on Lake Nicaragua, has steamer connection with San Juan del Norte, on the Caribbean. Reported length of telegraph wire, 3637 miles; 148 offices. Post offices, 151.

**FINANCE.** The standard of value since 1912 has been gold. The monetary unit is the córdoba, equivalent to the American dollar. For 1914, the reported revenue and expenditure were \$3,355,676 and \$4,809,490 respectively. Customs receipts in 1914, \$1,234,633; in 1915, \$787,767. The foreign (English) debt stood at \$1,179,620 on Dec. 31, 1915.

**GOVERNMENT.** The constitution bears date of April 5, 1913. The executive authority is vested in a president, who, with a vice-president, is elected by direct vote for four years. The president is assisted by a cabinet of five members and is ineligible for the next term. The legislative power is exercised by a congress of two houses, the Senate and the Chamber of Deputies. Senators (13 in number) are elected for six years, and deputies (40) for four years, all by direct vote. As a result of the revolution of 1910, a national congress on December 31st of

that year elected Gen. Juan J. Estrada President for two years, and Díaz Vice-President. Díaz succeeded to the executive office May 11, 1911, upon the resignation of Estrada, and on Nov. 2, 1912, as the unopposed Conservative candidate, was elected President for the term beginning Jan. 1, 1913. On Oct. 2, 1916, Emiliano Chamorro succeeded Adolfo Díaz as President.

In regard to the Canal Treaty with the United States the *Bulletin* of the Pan-American Union for May published the following item: "The Canal Treaty, which was ratified by the Chamber of Deputies in Managua on April 11th last by 27 affirmative votes out of 33 deputies present, seems to have had the immediate effect of greatly stimulating the business of the country. A number of important enterprises, which were kept in abeyance pending the final ratification of this treaty, now propose to make further investments in Nicaragua, and a notable revival in mining, agriculture, and industrial undertakings in the republic is confidently predicted in the near future." See UNITED STATES, *Treaties*.

**NICHOLAS, GRAND DUKE.** See WAR OF THE NATIONS.

**NICHOLSON, MEREDITH.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, American.

**NICHOLSON, THOMAS.** See METHODIST EPISCOPAL CHURCH.

**NICKEL.** See CHEMISTRY, INDUSTRIAL.

**NICOL, THOMAS.** A Scottish clergyman and theologian, died Aug. 7, 1916, at Aberdeen. He was born in 1846. His scholastic career was a brilliant one. In 1868 he took the M.A. at Aberdeen, with many honors, in 1871 graduated B.D. from Edinburgh, and subsequently he studied at Tübingen. He held charges in Scotland, lectured, and from 1886 to 1900 edited the *Church of Scotland Mission Record*. In 1899 he became professor of divinity and biblical criticism at Aberdeen, and this chair he held till his death. In 1914 he served as moderator of the Church of Scotland. His Croall and Baird lectures were published as, respectively, *Recent Archaeology and the Bible* (delivered 1897-98) and *The Four Gospels in the Earliest Church History* (delivered 1906-07).

**NIGER, MILITARY TERRITORY OF THE.** See MILITARY TERRITORY OF THE NIGER.

**NIGERIA, COLONY AND PROTECTORATE OF.** A British possession in West Africa, composed of the old protectorate of Northern Nigeria and the old protectorate and colony of Southern Nigeria, separated into three principal districts—colony proper (area, 1400 square miles), the Northern Provinces (255,700), and the Southern Provinces (78,000). The colored population is estimated to number in the neighborhood of 16,258,000; Europeans, 2600. The administrative headquarters of the colony and of the Southern Provinces is at Lagos, while that of the Northern Provinces is at present at Zungeru.

The principal tin fields are situated on the western boundary of the Central Province and in the provinces of Nassarawa, Zaria, and Kano adjoining that boundary. Tin also exists in the provinces of Ilorin, Calabar, and Yola, but as yet has not been found in payable quantities.

The pagan town of Bukuru may be taken roughly as the centre of the field (about 6000 feet above sea level), from which three great waterways of the Northern Provinces take their origin: Flowing westward the Niger River, becoming the Kwall, Danchandon, and eventually

the Kaduna; flowing northeast the Delimi River, that goes to Lake Chad; and flowing east the numerous tributaries of the Gongola, which joins the Benue, such as the Shen, Forum, Ropp, and Jarawa rivers. The ore won by the existing mines during 1913 amounted to 5530 tons, and in 1914 to 6143 tons. For 1914 the total imports were valued at £6,276,956 (£5,054,333 commercial and £1,222,623 government), and the total exports at £6,420,461 (£6,150,703 colonial products and £259,758 trans-shipped goods).

In June a religious movement of a dangerous character was reported to have spread over a considerable part of the Protectorate. It was especially strong among the negro tribes of the south. It had made itself manifest in 1915, but during the current year its spread had become rapid and it was said that about a million natives were involved in it. The leader was a fanatical negro who called himself Elijah II, and professed the ability to raise the dead and work other miracles.

**NIJINSKI, WARLAW.** See MUSIC, *Ballet*.

**NITRATE OF SODA.** See FERTILIZERS.

**NITRATE PLANT, GOVERNMENT.** See MILITARY PROGRESS, *United States*, material development.

**NITROGEN.** See CHEMISTRY, INDUSTRIAL; FERTILIZERS.

**NIVELLE, ROBERT.** See FRANCE, *History*; WAR OF THE NATIONS.

**NOBEL PRIZES.** It is necessary to correct a report received prior to the publication of the 1915 YEAR BOOK that the Nobel Prize in literature for that year was divided among Romain Rolland, Henrik Pontoppidan, T. F. Troels-Lund, and Verner von Heidenstam. The prize was awarded to the first three of these four. The prize for 1916, however, was awarded to Verner von Heidenstam (q.v.). Up to the end of the year the other prizes had not been awarded. Scientific research has been greatly affected by the European war, so that there has been difficulty in awarding the prizes for physics, chemistry, and medicine. The possibility that Pope Benedict XV would receive the peace prize for 1916 because of his efforts to bring the European war to an end has been mentioned frequently and King Alfonso of Spain was also mentioned.

**NORBECK, PETER.** Elected Republican Governor of South Dakota, Nov. 7, 1916.

**NORFOLK MUSIC FESTIVAL.** See MUSIC, *Festivals*.

**NORRIS, KATHLEEN.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, American.

**NORSWORTHY, NAOMI.** An American educator, died in New York City, Dec. 26, 1916. She was born in New York in 1877 and was educated at the New Jersey State Normal School, from which she received a State diploma in 1896. She received the degree of Bachelor of Science and a higher diploma from Teachers' College, Columbia University, in 1901; and graduated Ph.D. from Columbia in 1904. She taught in the public schools at Morristown, N. J. (1896-99), and was successively assistant (1901-02), tutor (1902-04), and instructor (1904-09) in psychology in Teachers' College; and thereafter adjunct professor of psychology at Columbia. She was the author of a book on *The Psychology of Mentally Deficient Children* (1906).

**NORTH CAROLINA. POPULATION.** The estimated population of the State on Dec. 31,

1916, was 2,418,569. The population in 1910 was 2,206,287.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn . . . . . 1916	2,900,000	53,650,000	\$59,015,000
1915	2,900,000	60,900,000	48,898,000
Wheat . . . . . 1916	950,000	9,975,000	17,556,000
1915	950,000	9,810,000	11,772,000
Oats . . . . . 1916	375,000	6,562,000	4,856,000
1915	350,000	8,050,000	4,991,000
Rice . . . . . 1916	300	6,000	5,000
1915	200	4,000	3,000
Potatoes . . . 1916	84,000	3,280,000	4,522,000
1915	85,000	3,150,000	2,800,000
Hay . . . . . 1916	390,000	a 507,000	8,872,000
1915	350,000	648,000	10,692,000
Tobacco . . . 1916	320,000 b	176,000,000	85,200,000
1915	320,000	198,000,000	22,221,000
Cotton . . . . 1916	1,482,000	646,000	59,742,000
1915	1,282,000	c 699,000	37,855,000
Rye . . . . . 1916	55,000	584,000	694,000
1915	50,000	575,000	604,000
Sweet potatoes . 1916	87,000	9,809,000	6,982,000
1915	85,000	8,925,000	4,998,000

a Tons. b Pounds. c Bales.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments . . . . .	4,931	5,507
Average number of wage earners . . . . .	121,478	186,844
Capital invested . . . . .	\$217,185,000	\$258,842,000
Wages . . . . .	34,855,000	46,039,000
The value of materials used . . . . .	121,861,000	169,942,000
The value of products . . . . .	216,656,000	289,412,000

**MINERAL PRODUCTION.** North Carolina ranks first among the Southern States in the production of gold. The total mined in 1915 was 8320 fine ounces, compared with 6043 in 1914. There was also a small silver production.

**TRANSPORTATION.** The total railway mileage of the State in 1916 was 4955. The lines having the longest mileage are the Southern Railway, 1364; the Atlantic Coast Line, 952; the Norfolk Southern Railway Company, 688; and the Sea Board Air Line, 610.

**EDUCATION.** The latest figures available for education are for the year 1914-15. In that year there were in the State 778,283 children of school age, of whom 525,107 were white, and 253,276 colored. The enrollment of white children was 409,728, and of colored children 189,918. The average daily attendance of white children was 288,134, and of colored children 119,630. There were 13,255 teachers, of whom 10,082 were white. The total expenditures for that year were \$5,566,992.

**FINANCE.** There was a balance in the treasury on Dec. 1, 1915, of \$133,435. The total receipts for the year amounted to \$5,227,230, and the disbursements to \$5,002,607, leaving a balance on Dec. 1, 1916, of \$224,623.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include hospitals at Morgantown, Raleigh, and Goldsboro, Epileptic Colony, School for the Blind, School for the Colored Blind and Deaf, Soldiers' Home, State

Prison, School for the White Deaf at Morgantown, Jackson Industrial and Manual Training School at Concord, and Orphanage for White Children and Orphanage for Colored Children at Oxford.

**POLITICS AND GOVERNMENT.** There was no meeting of the Legislature in 1916, and there was little interest in politics, outside purely local issues. There was no doubt as to the issue of the election for State officers. Thomas W. Bickett was nominated by the Democrats for Governor, and Frank W. Linney by the Republicans. In the election on November 7th Mr. Bickett was elected by a vote of 167,661, compared with 120,457 for Mr. Linney. In the election for President, Wilson received 168,383 votes, and Hughes 120,890. All the Democratic State officers were elected, and the Democrats elected all their candidates for Congress.

In the shooting of Jasper Allen in Carey County, on March 17, 1916, the career was ended of the last of the famous Allen clan, who, in 1912, created a reign of terror by killing five persons in the Carey County court house at Hillville, Virginia. Those who were killed at that time included Judge Thornton Massie, the county prosecutor, William M. Foster, the sheriff of the county, a juror, and a witness. Two members of the Allen clan were on trial at the time for disorderly conduct. The raid on the court was made with the object of liberating the prisoners. For this crime two of the Allens were executed, on May 28, 1913, six others received long terms of imprisonment, one was acquitted, and one turned State's evidence. Jasper Allen, whose death is noted above, was shot and killed by Will McGraw.

**STATE OFFICERS.** Governor, Thomas W. Bickett; Lieutenant-Governor, O. Max Gardner; Secretary of State, J. B. Grimes; Treasurer, B. R. Lacy; Auditor, W. P. Wood; Adjutant-General, Lawrence W. Young; Attorney-General, James M. Manning; Superintendent of Education, J. Y. Joyner; Commissioner of Agriculture, W. A. Graham; Commissioner of Insurance, J. R. Young—all Democrats.

**JUDICIARY.** Supreme Court: Chief Justice, Walter Clark; Justices, George H. Brown, William A. Hoke, William R. Allen, P. D. Walker; Clerk, J. L. Seawell.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Democrats .....	41	97	188
Republicans .....	9	22	81
Independent .....	..	1	1
Democratic majority..	82	74	106

**NORTH CAROLINA, UNIVERSITY OF.** A State educational institution at Chapel Hill, N. C., founded in 1795. In the fall of 1916 there were 1261 students and 97 faculty members. The productive funds of the institution amounted to \$182,594 and the income to \$261,658. The library contains 76,000 volumes. President, Edward Kidder Graham.

**NORTH DAKOTA. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 752,260. The population in 1910 was 577,056.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by

the United States Department of Agriculture, in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn .....	1916 510,000	13,515,000	\$11,853,000
	1915 700,000	9,800,000	6,566,000
Wheat .....	1916 7,150,000	89,325,000	59,774,000
	1915 8,350,000	151,970,000	132,214,000
Oats .....	1916 2,500,000	53,750,000	23,650,000
	1915 2,450,000	98,000,000	26,460,000
Potatoes ...	1916 75,000	6,975,000	8,021,000
	1915 80,000	7,200,000	2,952,000
Hay .....	1916 520,000	884,000	5,304,000
	1915 440,000	660,000	3,762,000
Rye .....	1916 350,000	4,655,000	5,819,000
	1915 280,000	4,200,000	3,318,000
Barley ....	1916 1,725,000	26,738,000	21,390,000
	1915 1,450,000	46,400,000	20,416,000

c Tons.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments ....	752	609
Average number of wage earners .....	2,789	3,275
Capital invested .....	\$11,585,000	\$14,218,000
Wages .....	1,787,000	2,416,000
The value of materials used ..	12,674,000	14,484,000
The value of products .....	19,137,000	21,147,000

**TRANSPORTATION.** The total railway mileage in the State in 1916 was 1460. The railways having the longest mileage of main track are the Great Northern, 426, the Northern Pacific, 377, and the Minneapolis, St. Paul, and Sault Ste. Marie, 361.

**EDUCATION.** The total population of the State in 1916 was 186,341. The total enrollment in the graded schools was 138,671, and in high schools, 9500. The average daily attendance was 124,996. The male teachers numbered 1329, and females numbered 6664. The average monthly salary of male teachers was \$74.99, and of females, \$59.84. See also UNIVERSITIES AND COLLEGES, *Surveys*.

**FINANCE.** The latest statistics for finance are for the fiscal year 1915. The receipts for that year from all sources amounted to \$4,704,229, and the disbursements to \$5,436,016, leaving a balance at the end of the year of \$901,639, which includes a balance at the beginning of the year of \$1,633,417. The State departments are under the budget system.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions of the State include the State Reform School at Mandan, State Penitentiary at Bismarck, Hospital for the Insane at Jamestown, Institute for Feeble-Minded at Grafton, School for the Blind at Bathgate, School for the Deaf at Devils Lake, Tuberculosis Sanatorium at Duneith.

**POLITICS AND GOVERNMENT.** North Dakota underwent a political revolution in 1916 and the State Judiciary, the Governor, all other State offices, and both branches of the Legislature are now under the control of the farmers, directed by recognized Socialists. Certain features of the campaign were unique. To understand it one must be familiar with preceding conditions. It was made possible by two things, an internecine warfare within the Republican ranks of North

Dakota, covering a period of 12 or 14 years, and a newspaper agitation that made the situation ripe for the political coup. Factional differences in the Republican party divided it into two wings known as the stalwart faction and the insurgents. Prior to 1912, by a combination with the Democrats, the insurgents captured practically all State offices except Governor and controlled the Legislature. The Democrats were given the governorship for six years. In 1912 L. B. Hanna, former Congressman, was elected Governor as a result of a get-together movement among the Republicans, and with a division of offices between the stalwarts and insurgents there was no trouble in gaining another Republican victory in 1914.

The Farmers' Equity Union, which was established in the State 10 or 12 years ago, gained great strength during the last six years. The members advocated a State-owned terminal elevator in Duluth, St. Paul, or Minneapolis. There was opposition to this plan by those favoring a terminal elevator but wanting it erected within the State and others who antagonized any proposition involving State-ownership theories. In the 1914 election the voters of the State endorsed the terminal elevator plan, but the succeeding Legislature, having a majority opposed to the idea, did not carry out the wishes of the voters. This aroused the farmers to a high degree of indignation and, with the agitation by public speeches and by the newspapers, conditions were created which made the political revolution possible. Charles Edward Russell, the Socialist writer, is credited with furnishing the plan that made the revolution a success. He is said to have spent some months in the State in the latter part of 1915 in conference with the different agitators and in combining the different groups into one organization. A. C. Townley, A. E. Bowman, F. B. Wood, widely known in State socialistic circles, and D. C. Coates, a socialistic organizer in Colorado and Washington State, have been the chief promoters of the plan. They first started to organize a socialistic movement and after making some progress changed their plans and organized the farmers into a Non-Partisan League, keeping Socialism as much in the background as possible.

By April, 1916, 35,000 farmers had joined the league, paying a membership fee of \$9. The leaders called a State convention of one Representative from each legislative district. These nominated a State ticket composed of men of former Republican affiliations in every case except the candidate for treasurer. The State-wide primaries in June endorsed the Non-Partisan League slate, the candidates receiving more votes than the combined opposition. So overwhelming was the victory that the Non-Partisan League completely captured the State Republican organization, including the State central committee. The ticket was elected in November.

The league announced its intention to support only candidates for the judiciary, the State offices, and the Legislature, but diverted sufficiently from that to support United States Senator McCumber for reelection. It did not participate in the election of county candidates nor did it advocate openly any presidential candidate. Secretly its support was thrown to Wilson and the State presented the anomalous position of electing a Republican Governor over the Democratic candidate four to one, a Republican

Senator over the Democratic Senator by an overwhelming majority, but giving the Democratic candidate for President a safe majority over the Republican standard bearer. For Governor, L. J. Frazier, Republican, received 87,665 votes and McArthur, Democrat, 20,351; for President, Wilson received 55,206 and Hughes, 53,471. Senator McCumber was reelected.

The Non-Partisan League, in full control of the judicial, executive, and legislative departments of North Dakota, planned an extensive line of legislation, largely along State-ownership and paternal lines. The ownership by the State of terminal grain elevators, State packing plants, flour mills, banks, trust companies, and other organizations, compulsory hail insurance, with a fixed tax against every acre of land, whether cultivated or uncultivated, a different form of taxation requiring the levy of practically all taxes on lands to the exclusion of farm improvements, a large tax on public utilities, with a general cleaning out of all State officials from the heads down to the stenographers and janitors, was the programme of the league for the coming legislative session.

The lower branch of the Legislature became Non-Partisan by about four to one, and the Senate almost equally divided. The results of the campaign were to intensify class feeling and to outline class legislation, with socialistic leanings, to a degree never before conceived in the State.

The league has carried its organization into Minnesota, South Dakota, and Montana, and announced its intention to organize these States along the same lines as in North Dakota. The membership fee was increased to \$16.

**STATE OFFICERS.** Governor, Lynn J. Frazier; Lieutenant-Governor, A. T. Kraabel; Secretary of State, Thomas Hall; Treasurer, John Steen; Auditor, Carl Kositzky; Attorney-General, William Langer; Superintendent of Education, N. C. MacDonald; Commissioner of Agriculture, John N. Hagan; Commissioner of Insurance, S. A. Olsness—all Republicans.

**JUDICIARY.** Supreme Court: Chief Justice, Andrew A. Bruce; Associate Justices, J. E. Robinson, L. E. Birdzell, and R. H. Grace.

**STATE LEGISLATURE.**

	Senate	House	Joint Ballot
Republicans .....	43	97	140
Democrats .....	6	16	22
Republican majority..	37	81	118

**NORTH DAKOTA, UNIVERSITY OF.** A co-educational State institution at Grand Forks, N. D., founded in 1883. The post office address is University, N. D. There was an enrollment of 909 students in all departments in the fall of 1916 and the faculty numbered 74. During the year the university lost by death Prof. George St. John Perratt, head of the department of Latin. The Greek and Latin courses were consolidated under a department of classical languages, with Prof. Gottfried E. Hult as head of the new department and Dr. Fred E. Smith as instructor. For 1916 the productive funds of the institution amounted to \$1,725,000 and the income from these funds to \$60,000. The library contains 60,000 volumes. President, Frank Le-Rond McVey. See UNIVERSITIES AND COLLEGES.

**NORTHERN TERRITORY.** A territory of the Commonwealth of Australia, occupying



the central and northern part of the continent between Queensland on the east and Western Australia on the west. The territory was transferred from South Australia to the Commonwealth Jan. 1, 1911. Its area is 523,620 square miles, which is about 17.6 per cent of the area of the Commonwealth. The population, according to the 1911 census, was 3310 (2734 males, 576 females), exclusive of full-blooded aborigines; there was a decrease of 31.2 per cent, the population in 1901 numbering 4811; estimate of June 30, 1915, 4448. The number of full-blooded aborigines, more or less civilized, returned by the 1911 census was 1223. Estimates of the total black population vary from 20,000 to 50,000. The capital is Darwin (population, 958 in 1911), from which a railway (3 ft. 6 in. gauge) extends 145.5 miles to Pine Creek. Administrator of the territory, J. A. Gilruth.

**NORTHWESTERN COLLEGE.** An institution for higher education, situated at Naperville, Ill. It was founded in 1861 and incorporated in 1876. It is a religious institution supported by the Evangelical Association, but is non-sectarian in its requirements for admission. It is a member of the North Central Association of Colleges. It has a faculty of 29 professors and lecturers and in 1916 had 291 regular college students besides 110 additional students. The number of regular college students is increasing. The value of the college property is over \$500,000. The expenditures in 1915-16 amounted to \$42,100.

**NORTHWESTERN UNIVERSITY.** A Methodist Episcopal educational institution at Evanston, Ill., founded in 1861. The total enrollment in the fall of 1916 was 5898 and the faculty numbered 452. Thomas Franklin Holgate was appointed president ad interim; Ulysses Sherman Grant, acting dean of the College of Liberal Arts; Dr. Arthur Isaac Kendall, acting dean of the Medical School. During the year a History Building was erected at a cost of \$173,496, given by Norman Wait Harris (q.v.). An endowment fund for maintenance of \$50,000 was raised. The total endowment, restricted and unrestricted, amounts to \$5,198,277, from which the university draws about 4 per cent income. The library contains 203,603 volumes. See UNIVERSITIES AND COLLEGES.

**NORTHWEST PROVINCES.** The Canadian provinces of Manitoba, Saskatchewan, and Alberta. See these titles and also CANADA.

**NORTHWEST TERRITORIES.** That portion of Canada not comprised within any province or the Yukon Territory. From the latter it extends eastward, the southern boundary being the 60th parallel as far as Hudson Bay. The Territories include Baffin Island and other large islands north of the continent. The area is 1,207,926 square miles, of which 34,298 water. Prior to 1912 the area was 1,921,685 square miles; in that year 178,100 square miles were annexed to Manitoba, 146,400 to Ontario, and 354,961 to Quebec. The population is very sparse and the means of subsistence scanty. The number of inhabitants as returned by the 1911 census was 18,481; this number was reduced by the annexations of 1912 to about 5900. The Territories are administered by a commissioner, assisted by a council of four members. The Commissioner is the head of the Royal Northwest Mounted Police. See CANADA, *Area and Population*.

**NORWAY.** A constitutional European monarchy, situated in the western portion of the Scandinavian Peninsula. Capital, Christiania.

**AREA AND POPULATION.** The total land area is 119,549 square miles; the total area including fresh waters, 124,675. The total *de facto* population, Dec. 31, 1910, was 2,357,790; *de jure* population, 2,391,782 (estimated Dec. 31, 1912, 2,439,209). Of the total *de facto* population, 1,662,513 resided in the rural communes, and 695,277 in towns. Males numbered 1,123,160, females 1,234,630. Agriculture and allied industries supported 898,259; fisheries, 134,685; mines, furnaces, etc., 247,077; manufactures, etc., 238,722; small enterprises and public utilities construction, 111,832; commerce, banks, and internal transportation, 279,866; navigation, 77,636; public administration and the liberal professions, 109,492; domestic labor, 101,865; without occupation, 45,701. Total population over 15 years of age, 1,525,564. In 1914 the marriages numbered 15,700, births 61,600 (4300 illegitimate), deaths, 32,900, emigrants 8522. Christiania had (1910) 241,834 inhabitants (*de jure*); Bergen, 76,867; Trondhjem, 45,335; Stavanger, 37,261. Lutherans are in the majority. All creeds are tolerated. Jesuits are debarred.

**PRODUCTION.** The agriculture census returned 1,111,949 acres under cultivation, 854,701 under sown and natural grasses, and 69,114 under forest. The total value of sown crops in 1911 was reckoned at 184,907,600 kroner (cereals, 36,497,200; potatoes, 35,604,400; hay, 112,806,000); in 1910, at 200,712,400; in 1908, at 270,872,500; in 1905, at 220,836,100; in 1903, at 211,927,000. The cereal production by no means keeps up with the consumption; in 1910 the total cereal production (including dried legumes) was 292,691,000 kilos; the total cereal import, 598,355,000 kilos. Potato yield in 1910, 568,289,000 kilos; import, 13,122,000 kilos. The following table shows the area in hectares and the production (1916 provisional) in quintals of main cereal crops in 1915 and 1916, with quintals per hectare in 1915:

	Hectares		Quintals		Qa.
	1915	1916	1915	1916	
Wheat ...	5,024	5,526	77,859	88,059	15.4
Rye .....	15,168	19,718	210,456	185,214	13.9
Barley ...	36,182	39,800	614,285	658,923	17.0
Oats .....	109,105	120,015	1,745,055	1,584,858	16.0

The 1915 live stock returns were as follows: 187,048 horses, 1,122,934 cattle, 1,335,870 sheep, 239,027 goats, 208,965 swine. Poultry is raised in considerable numbers. Persons employed in the 670 creameries, 68 cheese, and 4 condensed-milk factories, etc., 1021 men and 1710 women; these establishments receive during the average year 277,761.762 kilograms of milk and turn out 3,707,231 kilos of butter and 7,796,739 kilos of cheese.

The cod fisheries employed, in 1913, 96,693 fishermen. Value of output, 25,508 kroner; value of output of herring fisheries, 13,244,000 kroner; mackerel, 2,495,500; salmon and sea trout, 1,051,100; other fish, 8,334,000; lobsters, 1,115,600.

The mines in 1913 employed 7652 persons and produced ores valued at 21,472,000 kroner. Industrial establishments at end of 1913 numbered 6500, employing 143,917 persons.

**COMMERCE.** By royal decree of Aug. 2, 1914,

the export of cereals and flour has been prohibited, and that of raw cotton since May 23, 1915. As regards goods in transit, articles destined for a foreign (non-Norwegian) port may be re-exported without special permission, even if on the list of prohibited exports. The Norwegian government reserves the right to grant permission to export any of the prohibited articles in exceptional cases. Below is shown the trade for comparative years in kroner:

	1912	1913	1914
Imports	525,735,200	552,433,600	567,276,700
Exports spec.	324,622,600	380,912,100	394,390,000
Exports transit *	11,050,000	11,700,800	15,631,600

\* 1912 and 1913, direct transit not included.

The following table shows in thousands of kroner leading imports for consumption, and exports of domestic produce for the year 1914:

Imports	1000 kr.	Exports	1000 kr.
Cereals, etc.	74,225	Animal prods.	125,154
Ores	72,184	Timber	85,008
Machinery	71,641	Grease, etc.	87,521
Oils, etc.	44,826	Hair, skins	32,649
Textiles	48,813	Paper, etc.	30,151
Metal mfrs.	41,078	Metals	27,114
Provisions	38,532	Mineral mfrs.	20,592
Metals	37,847	Minerals, raw	19,482
Yarn, etc.	27,876	Ships	7,329
Wooden wares	18,798	Live animals	3,018
Animal prods.	17,585	Rope, etc.	1,975

The United Kingdom contributed imports valued at 159,185,800 kroner and received exports valued at 112,143,400 kroner; Germany, 151,298,800 and 92,726,400; Sweden, 78,684,500 and 34,930,200; Russia and Finland, 21,663,500 and 11,677,000; United States, etc., 83,749,400 and 70,230,800; Denmark, 33,641,800 and 20,217,100; France, 10,586,800 and 10,746,900; Netherlands, 22,007,300 and 15,983,700; Belgium, 12,757,100 and 9,397,700.

Vessels entered during 1914 numbered 10,103, of 5,720,888 tons; cleared, 10,130, of 5,638,836 tons. There were, Jan. 1, 1915, in the merchant marine, 2464 steamers, of 1,225,966 tons, and 950 sailing, of 561,921.

COMMUNICATIONS. On Dec. 31, 1915, there were 1967 miles of railway in operation (1685 state). Post offices, 3496. State telegraph and telephone lines (June 30, 1914), 12,505 miles; wires, 55,859; offices, 1582.

FINANCE. The krone (worth \$0.268) is the monetary unit. In the following table are shown revenue and expenditure for comparative years:

	1910-11	1911-12	1913-14
Revenue	128,279,596	140,780,210	175,962,000
Expenditure	120,905,430	132,932,368	166,716,000

The 1915-16 budget is detailed below, amounts in thousands of kroner:

Revenue	1000 kr.	Expenditure	1000 kr.
Customs	50,500	Railways	29,775
Income tax	24,000	Defense	29,501
Railways	30,798	Finance	6,619
Post office	11,100	Instruction	18,070
Tels. and tels.	8,800	Justice	5,355
Domains	6,521	Interior	14,081
Excise *	5,060	Highways	7,479
Excise †	4,000	Debt	5,659
Stamps	2,259	Interest	15,069
Succession	1,350	Foreign affairs	1,797
Fees	1,250	Civil list	746

Revenue	1000 kr.	Expenditure	1000 kr.
Mines	909	Storthing	824
Misc.	15,104	Misc.	...
Total ord.	161,650	Total ord.	161,650
Extraord.	19,381	Extraord.	19,881
Total	181,031	Total	181,031

\* Spirits. † Beer.

NAVY. See NAVAL PROGRESS.

GOVERNMENT. The executive power is vested in a king (Haakon VII, elected Nov. 18, 1905), aided by a council of state composed of responsible heads of departments. The Storthing (representative), made up of the Lagthing and the Odelsting, is the legislative body.

Heir-apparent, Prince Alexander, born July 2, 1903; renamed Olaf upon his father's accession to the throne.

HISTORY. The Storthing assembled in January, and on February 3rd defeated by a vote of 108 to 18 a Socialist motion for the denunciation of the treaty of 1907, in which Great Britain, Russia, France, and Germany guaranteed Norway's integrity. A constitutional amendment was adopted by a vote of 91 to 14 rendering women, who had already by the law of 1914 become eligible to the Storthing, also eligible to the Council of State. The iron miners went on strike in January.

Discontent among the workmen was caused by the bill for compulsory arbitration in labor disputes, which was pending in Parliament. A lockout had been declared in many trades by the Norwegian Employers' Association, and on account of the many strikes in the mining and iron industries, the lockout was enforced. A call for a general strike as a protest against the bill met with a response on June 7th from about 80,000 workmen. The bill was passed nevertheless, but the Socialists intervened and called off the strike. On June 15th the men returned to work.

See ARBITRATION, INDUSTRIAL.

NORWEGIAN LITERATURE. See SCANDINAVIAN LITERATURE.

NOTRE DAME, UNIVERSITY OF. A Roman Catholic institution for the education of men at Notre Dame, Ind. It was founded in 1842. In the fall of 1916 there were 1225 students in the university and the faculty numbered 80. The library contains 90,000 volumes, and in 1916 a new library building, costing \$225,000, was completed. President, Rev. J. Cavanaugh, C.S.C.

NOTT, CHARLES COOPER. An American jurist, died in New York City, March 6, 1916. He was born in Schenectady, N. Y., in 1827, graduated from Union College in 1848, and practiced law in New York until the outbreak of the Civil War. He served in the Union army as captain and then as colonel, and for 13 months, after his capture at Brashear, La., was a Confederate prisoner in Texas. President Lincoln in 1865 appointed Mr. Nott a judge of the Court of Claims, and by President Cleveland he was made chief justice of the same court. This post he held till his retirement in 1905. Besides a work on mechanics' lien laws, and 48 volumes of reports of the court over which he presided, he published *The Mystery of the Pinckney Draught*, New York (1909), *Sketches of the War* (rev. ed., 1911), etc.

NOVAES, GUIOMAR. See MUSIC, Artists, Instrumentalists.

NOVA SCOTIA. One of the Maritime Provinces of the Dominion of Canada: The cap-

ital is Halifax, the chief naval station of Canada. Area, 21,428 square miles, of which 360 water. Between 1901 and 1911 the population increased 7.13 per cent, or from 459,574 to 492,338. In 1911 Halifax had 46,619 inhabitants; Sydney, 17,723; Amherst, 8973; Sydney Mines, 7470; Yarmouth, 6600; New Glasgow, 6383. Of the population 10 years of age and over in 1911, males numbered 193,141 (51.08 per cent) and females 184,989 (48.92); of these, 148,991 males and 24,370 females were reported as employed in gainful occupations. Of the males employed, 31.7 per cent were in agriculture, 14.5 per cent in manufacturing, and 11.5 per cent in mining; of the females, 46 per cent were in domestic and personal service, 18.6 per cent in manufacturing, and 16.7 per cent professional.

The provincial government is administered by a lieutenant-governor, appointed for five years by the Governor-General of the Dominion; he acts through an executive council, or responsible ministry, of eight members. The legislative power is vested in the Legislative Council of 21 members appointed by the crown for life, and the House of Assembly of 38 members elected by direct vote for five years. In the 12th Parliament, which convened in 1911, Nova Scotia was represented by 10 Senators and 18 members of the House of Commons; the representation in the Commons on the basis of the 1911 census is 16. The Lieutenant-Governor in 1916 was David MacKeen.

**NOVATI, FRANCESCO.** An Italian philologist and literary historian, died in 1916. He was born in Cremona in 1859, became professor at Milan in 1883, at Palermo in 1886, at Genoa in 1889, and again at Milan in 1892. With Arturo Gal and Rodolfo Renier he founded the *Giornale storico della letteratura italiana* in 1883; and wrote and edited many articles and volumes on the Middle Ages and Renaissance in Italy. A number of his critical essays are collected in *Studi critici e letterari* (1889). His later publications include: *L'influsso del pensiero latino sopra la civiltà italiana del medio ero* (1897); *Attraverso il medio ero* (1905); *A ricolta* (1907); *Freschi e minii del dugento* (1908); *Storia letteraria d'Italia: le origini* (1900-09).

**NOVELS.** See articles on French, German, Italian, Russian, Scandinavian, and Spanish Literatures; also LITERATURE, ENGLISH AND AMERICAN.

**NOYES, NEWBOLD.** See LITERATURE, ENGLISH AND AMERICAN, *Poetry*, American.

**NUTRITION.** See FOOD AND NUTRITION.

**NUTTALL, ENOS.** An Anglican prelate, died at Kingston, Jamaica, May 31, 1916. He was born in England in 1842, but from the age of 24 he was identified with Kingston, first, for 14 years, as curate of St. George's Church, then, after 1880, as bishop of Jamaica, in charge of the diocese of Honduras, and also, from 1897, as Archbishop of the West Indies. After Kingston had suffered heavily from an earthquake shock in 1907, Archbishop Nuttall went to England and persuaded the British government to give the city £150,000 for rebuilding and relief, and obtained a loan of £800,000 on easy terms. He also did much to smooth over the situation when, at the time of the earthquake, Rear Admiral Davis, U.S.N., offered assistance, and this was declined by Sir Alexander Swettenham, then Governor of Jamaica.

**NYASSALAND PROTECTORATE.** A British protectorate extending from German East Africa to Portuguese East Africa, between Rhodesia and Lake Nyassa, and having an area stated at 39,801 square miles. Population (March 31, 1910), 970,430; 766 Europeans, 481 Asiatics (exclusive of Sikh troops), 969,183 natives. Population estimated, March 31, 1914, 831 Europeans, 410 Asiatics, 1,088,057 natives. The administrative headquarters are at Zomba; the chief town is Blantyre, in the Shiré Highlands. Total imports, 1914-15, £181,387; exports, £182,345; local revenue, 1914-15, £118,523; expenditure, £143,161. There is a railway (113 miles) from Blantyre to Port Herald; its extension to the Zambezi has been undertaken.

**OATS.** The world's oats production in 1916 was below that of the preceding year. The International Institute of Agriculture, Rome, estimated the production of the northern hemisphere at 4,459,735,230 bushels, a figure based to the extent of 62.5 per cent on reports sent in by countries and of 37.5 per cent on the average production for the five years 1909-13 as representing the yield of 1916 in countries not furnishing data. This last class included Germany, Austria, Hungary, Belgium, Bulgaria, Denmark, France, Luxemburg, Sweden, Japan, and Algeria. A third group of countries comprising Greece, Portugal, Turkey in Europe and Asia, Mexico, China, and Persia, for which no recent data exist but whose production is placed at about 41,340,000 bushels, is not included in the above estimate. The production of 1916 of the first and second group of countries represents only 89.8 per cent of that of 1915, but is 3.2 per cent above the five years' average. The 1915-16 harvest of oats in the southern hemisphere was one of the best ever secured, and amounted as estimated to 113,678,110 bushels, but the crop of 1916-17 was reported as not very promising. With the remainder of the preceding year's crop of the northern and southern hemispheres the available supply of oats for the year is placed at 4,968,536,360 bushels as against a requirement of 4,694,735,760 bushels, including 498,050,000 bushels necessary for seed. The average prices for Argentine oats for the six months April to September, 1916, were 28.6 cents and 81.6 cents per bushel in Buenos Aires and London respectively. The corresponding price for oats at Chicago was 45 cents. The ocean freight rates for oats were based on those for wheat, with an additional percentage under certain conditions. Maximum and requisition prices were fixed for oats in Germany, Austria, Hungary, and France, and exportation of the cereal was either prohibited or very much restricted in most European countries, belligerent and neutral.

The oats crop of the United States in 1916 as estimated by the Department of Agriculture amounted to 1,251,992,000 bushels produced on 41,539,000 acres at the average rate of 30.1 bushels per acre. As compared with 1915 the production was smaller by 297,038,000 bushels, and the yield per acre by 7.7 bushels. The acreage was the largest ever recorded. The average farm value on Dec. 1, 1916, was 52.4 cents per bushel as against 36.1 cents on Dec. 1, 1915, and on this basis the total value of the crop was \$656,179,000, which had never been equaled. The value per acre on this same basis was \$15.80. Among the States Iowa ranked first in yield with 186,850,000 bushels, Illinois second

with 172,095,000 bushels, and Minnesota third with 88,112,000 bushels. The acreage in Iowa was 5,050,000, in Illinois, 4,470,000, and in Minnesota, 3,325,000 acres, and the average yields per acre, 37, 38.5, and 26.5 bushels respectively. The highest average yields were secured in the extreme Northwest, where Washington produced at the rate of 52 and Oregon at the rate of 48 bushels per acre. Canada, owing to an unfavorable season, produced only 75 per cent of a normal crop. A number of new and improved varieties of oats were distributed in the United States during the year by the agricultural experiment stations.

**OBERLIN COLLEGE.** A non-sectarian co-educational institution at Oberlin, Ohio, founded in 1833. In the fall of 1916 the total registration of students was 1565, chiefly divided among the College of Art and Sciences, the Graduate School of Theology, and the Conservatory of Music. The officers of the institution numbered 158, of whom 121 were on the teaching staff. During the year the following changes among others were made in the faculty: Clarence Ward, formerly associate professor at Rutgers and lecturer at Princeton, was appointed professor of the history and appreciation of art and director of the Art Museum; John Taylor Shaw, who for 25 years had been principal of the Oberlin Academy, was transferred to the college as associate professor of Latin; Albert Temple Swing, after 23 years of service, retired as professor of church history in the Graduate School of Theology, becoming professor emeritus. He was succeeded by Ian Campbell Hannah. In the conservatory of music Maurice Koessler was appointed professor of violin and ensemble. Miss Frances Juliette Hosford, dean of Academy women and associate professor of Latin, became chairman of the deans of women. President King was given a half year's leave of absence for travel and study, and Azariah Smith Root, librarian and professor of bibliography, received a year's leave to become acting principal of the New York Library School. In 1916 a contract was made for the purchase of property on which to erect the Hall Auditorium, provided for by the will of Charles M. Hall, who had left \$3,000,000 to the college. For this building Cass Gilbert was chosen architect. By the will of Dr. Dudley P. Allen and gift of Mrs. Allen, provision was made for the erection of an Art Building, which was nearing completion at the end of the year, and for a \$100,000 endowment for the teaching of art history. A site for the building was presented by John L. Severance. By will of Dr. Allen also, \$50,000 was given to erect and equip a Hospital Building and \$50,000 for a Nurse Fund. A gift of \$100,000 to the Graduate School of Theology was announced from Mrs. D. Willis James, who died in April, 1916. A like amount had been given by her earlier. From Frederick Norton Finney's estate Oberlin is to receive about \$195,000. On Aug. 31, 1916, the productive funds of the college amounted to \$2,537,012 and the total income for 1915-16 was \$337,143. The library contains 165,000 bound volumes and 142,000 unbound volumes. President, Henry Churchill King.

**OBSERVATORIES, ASTRONOMICAL.** See ASTRONOMY.

**OCCUPATIONAL DISEASES.** The rapid development of workmen's compensation legislation in the United States has been accompanied

during the last few years with the application of the idea that diseases incident to employments should be treated in a manner similar to the treatment of industrial accidents. Detailed studies have been made of the diseases contracted by workers in specified occupations, and an effort has been made to determine the exact causes of these injuries. The result has been that a beginning has been made of the collection of data on the basis of which some form of insurance protection can be provided because the incidents of these diseases and effective measures for their prevention or reduction have been applied. An important aspect of the movement at this stage of its development is the perfection of laws requiring the reporting of all occupational diseases to some centralized State authority, such reporting being required of physicians usually under some legal penalty. The more extensive the investigation becomes the more clearly it is realized that occupational diseases are very widespread and constitute an important aspect of problems of labor, poverty, and poor relief.

**GREAT BRITAIN.** The committee appointed for the study of conditions in British munitions factories reported on various phases of sanitation and health which are important in throwing light on occupational diseases. Industrial fatigue is caused by fatigue in the nervous system with direct and indirect effects, and an important symptom is want of coordination and failure in powers of concentration with an increased frequency of accidents and spoiled work. Hourly rest as well as daily and weekly rest is recommended, especially in the very heavy work of molding. There is also danger for the munitions worker in exposure to lead and nitrous fumes by which serious and possibly fatal illness may be caused. Contact with various chemicals used in metal turning may result in troublesome skin affections. Air free from dust and fumes, good washing facilities, and protection from direct contact are the chief preventive measures in diseases of this kind.

Trinitrotoluol is a highly poisonous substance used in the manufacture of explosives, and it causes illness through escape of nitrous fumes and of chlorine and chlorine compounds, all of which may be absorbed by inhalation, by contact with the skin, and by the alimentary canal. As a result of this absorption, illness may follow from general effects on constituents of the blood or from local effects on the skin. The symptoms are a persistent cough due to no known cause, unaccustomed shortness of breath, fatigue unexplained by exertion, and sudden pains in feet and legs; these may develop quickly. Effective ventilation, proper clothing, sufficient washing facilities, and proper diet are the means recommended for minimizing danger from absorption.

**NEW YORK CITY.** In the fall of 1915 Dr. S. S. Goldwater, at that time commissioner of health of New York, opened a clinic for occupational diseases, Dr. Louis Harris being in direct control. From 150 to 175 persons are examined each day by 17 to 20 physicians. At first food-handlers were examined and the total number of people in occupations of this class who presented themselves for examination in six months' time was 110,000. Then workers in the trades of hatters, hatters' furriers, and furriers were examined. There is no law compelling examination of workers in these trades, as in the food-

handling trades, so the men had to be induced to come voluntarily. This was done by means of trade unions in the organized shops and by inspectors using persuasion with the employer of unorganized shops, and the report shows 113 shops studied and 889 persons examined.

In making fur garments, dust of a very irritating character is breathed in, but it is only mechanically injurious to throat and lungs. But in making felt hats and preparing the fur for felting there is the additional danger of mercurial poisoning. Of 266 men examined who were engaged in preparing fur for felting only 17 were found free from physical defect. Of 81 hatters examined 69 came in contact with mercury and only five were found to be normal. The city plans eventually to use the knowledge thus gained in controlling work done for the city by insisting that all municipal and contract work be done under proper safeguards in order to eliminate as far as possible dangers to health. Then having established a standard for such work the city can proceed to make it compulsory for private industry also.

**EXHIBIT OF THE AMERICAN MUSEUM OF SAFETY.** In January the American Museum of Safety had an exhibit in New York City of models showing the effects of trade diseases. The models used were made of a waxen composition and were colored in such a way as to give realistic effects. They showed chiefly injuries to and evidences of diseases of the hand caused by certain trades. As further educational propaganda, lectures on accident prevention and factory conditions accompanied by moving pictures were given during the luncheon hour.

**ANILINE POISONING.** Luce and Hamilton report the results of a study of aniline poisoning in the United States which is important in view of the great increase in the manufacture of aniline dyes in this country since the German supply has been cut off. It is said that there are already over a dozen factories in operation and that more are likely to be constructed. The manufacture of aniline from coal tar involves exposure to poisons that are new to American sanitarians, although the experience of the Germans and to some extent that of the French and English is well known. Aniline poisoning, in connection with the manufacture of rubber, first came under notice in the tire factories of Akron, Ohio, and was for some time unidentified. A peculiar disease had appeared among the rubber workers, some of whom were at first thought to have cardiac disease and others epilepsy. The malady is now common and well recognized and the victims are known as "blue boys" from the cyanosis which is a prominent symptom. Workers in aniline factories are exposed to a number of highly poisonous volatile compounds. The making of aniline dyes begins with coal tar, which is itself a mixture of benzene, xylene, and other substances, all volatile poisons. The benzene is treated with nitric and sulphuric acids to form nitrobenzene, also a very dangerous poison. The nitrobenzene is in its turn reduced to aniline through the action of iron filings and hydrochloric acid. The action of nitrous acid on aniline and its allied amines produces many of the aniline colors. The workers therefore are exposed to poisoning from benzene, nitrobenzene, and aniline, as well as a host of other allied substances. Methyl alcohol is also used as a reagent. Besides being used for the production of

dyes aniline oil enters extensively into the rubber industry, where it is necessary for the compounding of rubber, and in reclaiming rubber from scrap. Industrial poisoning therefore, which was negligible in this country until very recently, has suddenly assumed decided importance.

The symptoms, common to poisoning by members of the whole aniline group including nitrobenzene and its derivatives, are at first weariness or sleepiness, followed by flushing of the face, a sense of fullness in the head, slight mental confusion, dryness of the throat, and difficulty in swallowing. The color of the face progresses from red to a livid blue, and the pulse is rapid and weak. There are headache, dizziness, nausea, and finally shortness of breath and loss of consciousness. Usually industrial cases of aniline poisoning do not develop the severer symptoms, and the patient seeks advice merely on account of his blue color and the general vasomotor depression; but occasionally epileptoid convulsions are seen, also protracted coma. The chronic cases resulting from repeated doses, usually exhibit headache, disturbance of vision, a sense of exhaustion, muscular twitching, and dizziness. The poison is believed to enter by way of the skin or lungs, or both. Aniline and its derivatives are true blood poisons, the principal action of which is to promote the formation of methemoglobin which replaces oxyhemoglobin. The former substance keeps its oxygen firmly bound, the latter liberates it freely. The condition is therefore one of "internal suffocation," or lack of oxygen in the tissues.

**DOPE POISONING.** A similar form of poisoning is observed in the new industry of making aeroplanes. Five fatal cases have been reported among employees working as tapists, who are engaged in putting on strips of fabric over the seams, after dipping them in "dope" which consists of acetate of cellulose, or celluloid dissolved in tetrachlorethane with amyl alcohol and benzene.

**INDUSTRIAL ACCIDENTS.** Bloedorn has made a study of the accidents occurring among workmen in the United States Navy Yard at Washington, D. C., for a period of two years, beginning Jan. 1, 1914, with a careful analysis of the various factors which entered into their production. The average number of men employed was 3202, and the total number of workmen who suffered from one or more injuries was 2178. The highest percentage of injuries occurred in workmen between the ages of 16 to 20 and decreased steadily until the group between 50 and 59 was reached, when there took place a constant rise with advancing age. Colored employees had a higher rate than white, and single men were injured oftener than married men. New and unskilled workmen had a higher rate than the skilled workmen. One observation contradicts the accepted theory that the proportion of injuries increases with the advancing day, owing to fatigue. The Navy Yard statistics show the greatest percentage of injuries during the first two hours of work. The explanation offered is that this period constitutes the time of adjustment of the workman to his machinery. See **LABOR LEGISLATION**. For occupation as a factor in the causation of disease see also **TUBERCULOSIS**.

**Bibliography.** The year's publications included: G. M. Kober and W. C. Hanson, *Diseases of Occupation and Vocational Hygiene*;

Thomas Oliver, *Occupations from the Social, Hygienic, and Medical Points of View*; R. H. Pearson, *Occupational Diseases*. The United States Public Health Service has issued a series of *Studies in Vocational Diseases*, and special reports were issued by the labor departments of New Jersey and New York; one of the latter was *European Regulations for the Prevention of Occupational Diseases*.

**OCEANIA.** See ANTHROPOLOGY.

**OCEANIC DEPOSITS.** See GEOLOGY, *Oceanic Deposits*.

**O'CONNELL, JOSEPH J.** An American physician and sanitarian, died at the Quarantine Station, Staten Island, N. Y., Jan. 1, 1916. He was born in Brooklyn, N. Y., in 1868, studied at St. Francis College, and in 1887 graduated from the Long Island Medical College. He served as alienist of the Kings County Hospital and for some years had charge of the contagious disease bureau of the Brooklyn Board of Health. Appointed health officer of the port of New York by Governor Dix in 1912, Dr. O'Connell proceeded to institute important reforms. Among these was the construction of the Quarantine Pathological and Bacteriological Laboratory, one of the model institutions of its kind. In 1914, during trouble with typhus in New York harbor, he devised a system of sanitation which was later adopted in some of the European armies in the great war. He wrote on subjects in his special field and lectured at New York University and at the Long Island College Hospital.

**OFFICE BUILDINGS.** See ARCHITECTURE.

**OHIO. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 5,181,220. The population in 1910 was 4,767,121.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16, were as follows:

	Acreage	Prod. Bu.	Value
Corn . . . . . 1916	3,675,000	115,762,000	\$104,186,000
1915	3,700,000	153,550,000	85,988,000
Wheat . . . 1916	1,500,000	20,250,000	34,222,000
1915	1,980,000	40,194,000	41,802,000
Oats . . . . . 1916	1,717,000	48,076,000	25,480,000
1915	1,683,000	69,008,000	24,841,000
Potatoes . . 1916	140,000	6,300,000	11,466,000
1915	153,000	12,546,000	8,782,000
Hay . . . . . 1916	3,100,000	4,867,000	51,590,000
1915	2,812,000	a 4,049,000	51,422,000
Tobacco . . 1916	100,000	95,000,000	12,350,000
1915	93,700	b 84,330,000	7,590,000
Rye . . . . . 1916	75,000	1,088,000	1,306,000
1915	100,000	1,750,000	1,452,000
Barley . . . 1916	83,000	917,000	734,000
1915	30,000	930,000	502,000

a Tons. b Pounds.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments	15,138	15,658
Average number of wage earners	446,934	510,435
Capital invested	\$1,300,733,000	\$1,677,552,000
Wages	245,450,000	318,924,000
The value of materials used	824,202,000	1,020,782,000
The value of products	1,437,936,000	1,782,808,000

**MINERAL PRODUCTION.** There was great progress in the coal industry of the State in 1916. The increased production is estimated by the United States Geological Survey at 65 per cent, or from 22,435,000 tons in 1915 to 37,000,000 tons in 1916. The production in 1913, the banner year for the State, was 36,200,000 tons. In 1914 it was 18,843,000 tons. In January, February, and March, 1916, the production averaged nearly 3,000,000 tons a month. April showed a decrease of nearly half, but after the lake season began the output increased, and in June it had reached the high record for the year, more than 3,500,000 tons. From July to October an almost even rate was obtained, but in November and December there was a slight decrease. About 5,000,000 tons of coal from Ohio were shipped from the lakes, a larger quantity shipped than in any previous year, except 1913. There was a substantial increase in the quantity of coal taken by the railroads for fuel, and the largest factors were greater shipments by the lakes and increased demands from industrial plants, chiefly within the State. During the period of labor troubles in western Pennsylvania coal from Ohio was shipped into the Pittsburgh district to supply the shortage, and in the last quarter of the year Ohio coal was shipped by way of Buffalo to New York and New England. Lack of transportation facilities was not felt in Ohio as in other fields, probably because of the shorter average haul to market.

The production of petroleum in the State in 1915 was 7,825,326 barrels, compared with a production of 8,536,352 barrels in 1914.

**TRANSPORTATION.** The total railway mileage of the State on June 30, 1914, the latest date for which statistics are available, was 9147.

**EDUCATION.** The total school population for 1916 was 1,305,553. The total enrollment in the public schools was 949,470. The average daily attendance was 768,451. There were 23,967 female teachers, and 7852 male teachers. The average annual salary for men teachers in the cities in elementary schools was \$791; in village schools, \$502; in rural schools, \$458. For women in elementary city schools, \$520; in village schools, \$457; and rural schools, \$422. The average salary of men in city high schools was \$988, in village schools, \$792, and \$740 in rural schools. For women in city high schools, \$792; in village high schools, \$634; and in rural high schools, \$608.

**FINANCE.** The total receipts for the fiscal year 1916 amounted to \$19,175,760, and the disbursements to \$19,695,902. There was a balance at the beginning of the year of \$7,390,565, and at the end of the year of \$6,870,423. The chief sources of revenue are from insurance companies, from automobile licenses, and from excise taxes. The State has no bonded debt.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include the following: The Athens State Hospital, the Cleveland State Hospital, the Columbus State Hospital, the Dayton State Hospital, the Lima State Hospital, the Longview State Hospital at Cincinnati, the Massillon State Hospital at Massillon, the Toledo State Hospital, the Ohio Hospital for Epileptics at Gallipolis, the Institution for Feeble-Minded at Columbus, the State School for the Blind at Columbus, the State School for the Deaf at Columbus, the Ohio State Sanatorium at Mount Vernon, the Ohio Soldiers' and Sailors'

Home at Sandusky, the Madison Home at Madison, the Boys' Industrial School at Lancaster, the Girls' Industrial School at Delaware, the Ohio Penitentiary at Columbus, the New Prison Farm at London, the Ohio State Reformatory at Mansfield, the Ohio Reformatory for Women at Marysville, and the Ohio State Brick Plant at Junction City. The Ohio Reformatory for Women and the Lima State Hospital were opened in 1916.

**POLITICS AND GOVERNMENT.** There was no session of the Legislature in Ohio in 1916. Late in the year Governor Willis was strongly urged to call a special session to secure legislation permitting Ohio national guardsmen on the Mexican border to vote at the November election, but he refused. Under the Ohio constitution all township and municipal elections occur in the odd-numbered years, while State officials, the Legislature, and all county officials are chosen in the even-numbered years. The presidential primary was held April 25th, but was largely devoid of interest. On the Republican side it was agreed that the State's indorsement for President should go to former United States Senator Theodore E. Burton of Cleveland. The Ohio law requires that the voters of each party shall express a second as well as a first choice for President. Accordingly, Ohio Republicans agreed that Paul Howland of Cleveland, former Congressman, should be their second choice. No nomination was made against either Burton or Howland. On the Democratic side it was agreed with equal unanimity that President Wilson should receive the State's indorsement for reelection. To fulfill the requirements of the law former Gov. James E. Campbell of Cincinnati was made the Democratic second choice for the presidency. The regular State primary was held August 8. Gov. Frank B. Willis had been chosen in April as one of the State's Republican Big Four delegates to the Chicago convention, while former Gov. James M. Cox of Dayton had been similarly honored by the Democrats. The great strength each of these former political opponents showed in this earlier primary clearly indicated his nomination for Governor in August. Governor Willis was renominated by an overwhelming majority. Cox encountered more opposition than Willis, but his nomination was at no time in doubt. For United States Senator the Republicans nominated former Gov. Myron T. Herrick, who had more recently been American ambassador at Paris, his opponents in the primary being former United States Senator Charles Dick of Akron and Harry M. Daugherty of Columbus. The size of Herrick's plurality in the primary was a surprise. Dick's vote was small. On the Democratic side United States Senator Atee Pomerene was conceded renomination, though John J. Lentz entered the race against him. The Republican State platform was adopted in June and the Democratic in August. They differed but little on State issues. A significant feature of each was its promise that the next Legislature should endeavor to give Ohio cities relief from their financial difficulties caused by hampering State legislation. So far as the State campaign was concerned the fight became a comparison between the administration of Willis and that of Cox as Governor, each having served in the office two years, the one in immediate succession to the other. Tax reforms and economy were chief

topics of discussion. Upon no issue were the parties sharply divided. Both candidates spent weeks on the stump. President Wilson and Republican candidate Charles E. Hughes also visited the State during the campaign. Theodore Roosevelt made a series of speeches urging the election of Hughes. Former Progressives appeared generally to be supporting the Republican candidates, national and State. At the November election the entire Democratic State ticket was elected. Democrats won a majority of the Congressional delegation and will control both branches of the Legislature, which meets in January. President Wilson's vote was 604,161, against 514,753 for Hughes, giving Wilson a plurality of 89,408. Cox for Governor polled 568,218, against 561,602 for Willis, giving Cox a plurality of 6616. For United States Senator, Pomerene won over Herrick by a plurality of 35,897, the figures being: Pomerene 571,288, Herrick 535,391. Every elective office at the State capitol will be held by the Democrats after the first of January.

There were labor troubles in the State in the first part of the year and in January riots caused the loss of lives and the destruction of much property at East Youngstown, where 3600 employees of the Republic Iron and Steel Company struck for an increased pay from 19½ cents to 25 cents an hour. The company offered an increase to 22½ cents, but this was rejected, and on January 7th rioting began. A mob of strikers attacked a body of workmen who had not struck, and the throwing of stones was followed by pistol shots, exchanged between the mob and the guards. Several persons were injured. Immediately afterwards they began to set fire to buildings and loot saloons and stores. Before morning ten blocks of buildings, practically the entire business section of East Youngstown, had been destroyed by fire, with a loss of about \$2,000,000. Nearly 100 persons were wounded. After some delay a party of policemen and citizens from the neighboring city of Youngstown dispersed and drove away the rioters. More than 100 were placed in jail. At daybreak on January 8th three regiments of militia arrived and were placed on guard.

**Cleveland.** Three special elections were held in Cleveland during 1916 for the submission of public improvement bond issues to popular vote as required by law. On April 25th an issue of \$2,500,000 was authorized for the erection of a municipal auditorium in the civic group. Most of the site had been acquired before the end of the year. On August 8th a proposed bond issue of \$3,500,000 for street extensions and improvements was defeated. On November 7th issues were authorized as follows: \$3,000,000 for street improvements, \$2,000,000 for new school buildings, \$1,750,000 for extension of the municipal electric light plant. Toward the end of the year an agitation was begun to amend the Cleveland charter so as to provide a city manager form of government. The year 1917 is likely to see this proposal come to an issue at a special election.

**STATE OFFICERS.** Governor, James M. Cox; Lieutenant-Governor, Earl D. Bloom; Secretary of State, William D. Fulton; Treasurer, Chester E. Bryan; Auditor, Vic Douahey; Attorney-General, Joseph McGhee; Board of Agriculture, Renick W. Dunlap—all Democrats.

**JUDICIARY.** Supreme Court: Chief Justice,

Hugh L. Nichols; Associate Justices, Thomas A. Jones, Edward S. Matthias, James G. Johnson, Maurice H. Donahue, O. W. Newman, R. M. Wanamaker; Clerk, Frank McKean.

## STATE LEGISLATURE.

	Senate	House	Joint Ballot
Democrats .....	25	72	97
Republicans .....	11	56	67
Democratic majority ...	14	16	30

**OHIO STATE UNIVERSITY.** A co-educational State institution at Columbus, Ohio, founded in 1872. In the fall of 1916 the total enrollment was 5761 and the faculty numbered 541. During the year a professional College of Commerce and Journalism was established. The university has productive funds amounting to \$1,009,258, from which it drew an income in 1916 of \$60,555. The total income was \$1,730,975. In the library were 162,000 volumes. President, William Oxley Thompson.

**OHIO UNIVERSITY.** A co-educational State institution at Athens, Ohio. It was founded in 1804. The number of different students in all departments of the university for the year 1916 was 4962. There were 88 members of the faculty. During the year Prof. Henry W. Elson resigned to become president of Thiel College. After he vacated his chair, two independent departments of history and economics were established, C. L. Martzoff being appointed professor of the former subject, and Herbert B. Simpson of the latter. Dr. William Hoover, professor of mathematics, resigned and was succeeded by Robert Lacey Borger. William E. McVey became director of extension work and Miss Mary Tough head of the department of home economics. Prof. Théophile Dambac accepted the chair of Romance languages. The university has in productive funds \$156,504, and in 1916 drew from all sources an income of \$300,533. The library contains 47,000 volumes. President, Alston Ellis.

**OHIO WESLEYAN UNIVERSITY.** A co-educational Methodist Episcopal institution at Delaware, Ohio, founded in 1844. Certain departments of the University are in Cleveland. In all departments in the fall of 1916 there were 1172 students and the faculty numbered 81. During the year Dr. Herbert Welch, the president, was elected bishop of the Methodist Episcopal Church, and Dr. John W. Hoffman was chosen as his successor. The productive funds of the institution amount to \$1,095,000 and the total income from all sources in 1916 was \$159,600. The library contains 70,000 volumes.

**OIL, CRUDE.** See PETROLEUM.

**OIL ENGINES.** See INTERNAL COMBUSTION ENGINES.

**OKLAHOMA. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 2,245,968. The population in 1910 was 2,026,534.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16, were as follows:

	Acreage	Prod. Bu.	Value
Corn ..... 1916	3,950,000	58,825,000	\$49,592,000
..... 1915	3,800,000	112,100,000	51,566,000
Wheat .... 1916	8,050,000	29,585,000	49,407,000
..... 1915	8,850,000	38,860,000	34,585,000

	Acreage	Prod. Bu.	Value
Oats ..... 1916	1,160,000	15,080,000	8,596,000
..... 1915	1,350,000	36,450,000	12,758,000
Potatoes .. 1916	84,000	1,802,000	8,514,000
..... 1915	85,000	2,975,000	2,499,000
Hay ..... 1916	550,000	825,000	7,425,000
..... 1915	550,800	a 1,265,000	7,064,000
Cotton .... 1916	2,593,000	885,000	75,882,000
..... 1915	1,895,000	b 640,000	34,628,000
Rye ..... 1916	9,000	90,000	112,000
..... 1915	6,000	81,000	62,000
Barley ... 1916	8,000	100,000	100,000
..... 1915	8,000	212,000	106,000

a Tons. b Bales.

See AGRICULTURAL LEGISLATION.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments ....	2,310	2,518
Average number of wage earners .....	18,143	17,443
Capital invested .....	\$38,878,000	\$65,478,000
Wages .....	7,210,000	11,011,000
The value of materials used ..	34,158,000	70,970,000
The value of products .....	58,682,000	102,006,000

**MINERAL PRODUCTION.** The production of coal in Oklahoma in 1915 amounted to 3,693,580 short tons, valued at \$7,435,906, a decrease of 7 per cent in quantity, and \$768,109, or 9 per cent in value. The number of men employed during the year was 8457, compared with 8078 in 1914.

The lead and zinc production was approximately the same as in 1914. The value of the recoverable lead and zinc in 1915 was \$4,236,636, compared with \$2,019,973 in 1914. The metal content on lead concentrates decreased from 7556 tons in 1914 to 7306 in 1915, but the value increased \$97,376. The recoverable spelter increased from 13,992 tons valued at \$1,427,184 in 1914 to 14,314 tons, valued at \$3,549,872, in 1915.

The production of petroleum in Oklahoma in 1915 far surpassed that of any previous year, and placed the State in the front rank as an oil producer. For the first time since 1908 it surpassed California. There were produced 97,915,243 barrels, valued at \$56,706,133, compared with 73,831,724 barrels, valued at \$57,253,187, in 1914.

The production of coal in the State in 1916 is estimated at 3,470,000 tons, a decrease compared with 1915 of 224,000 tons, or about 6 per cent. The production was curtailed by lack of business during the earlier part of the year at a time when most of the coal fields were producing at a high rate. The demand for coal improved after September 1st, but labor trouble resulted in a temporary shutting down of the mines, and on some of the railroads there was a shortage of cars.

**TRANSPORTATION.** The total railway mileage on June 30, 1916, was 6432. These figures are for main track. There were constructed during the year about 30 miles of new track. Kansas and Oklahoma Southern did a considerable amount of grading during the year. The Ringley and Oil Fields Railroad is being laid on a line from Ringley to Oklahoma City, approximately 120 miles. The railways having the



longest mileage are the St. Louis and San Francisco, 1498; Chicago, Rock Island, and Pacific, 1326; the Atchison, Topeka, and Santa Fe, 992; and the Missouri, Kansas, and Texas, 703.

**EDUCATION.** The total school population of the State in 1916 was 587,134. The total enrollment was 514,401, and the average daily attendance 325,032. There were 3802 male teachers, and 8928 female teachers. The average monthly salary of first grade male teachers was \$84.02, and of female teachers \$63.05; of second grade male teachers \$66.65, and of female teachers \$58; of third grade male teachers, \$57.24, and of female teachers \$50.12.

**FINANCE.** The total receipts from all sources in 1916 amounted to \$6,261,511. The total disbursements amounted to \$5,393,927. The balance on hand at the beginning of the fiscal year July 1, 1915, was \$1,055,196, and at the close of June 30, 1916, the balance was \$1,922,780. The bonded debt of the State was \$4,367,000. The chief source of revenue aside from ad valorem taxes is the gross production tax on oil. The chief expenditures are for the support and maintenance of the educational institutions.

**CHARITIES AND CORRECTIONS.** The State penal and charitable institutions include the Oklahoma State Orphans' Home at Pryor, the Confederate Soldiers' Home at Ardmore, Hospitals for the Insane at Vinita, Supply, and Norman, School for the Blind at Muskogee, Institute for Feeble-Minded at Enid, State Training School for Boys at Pauls Valley, School for Deaf and Dumb at Sulphur, Industrial School for Girls at Chickasha, Industrial School for Deaf, Blind, and Colored Orphans at Taft, Training School for Negro Boys at McAlester, School for Wayward Incurable Girls at Oklahoma City, State Penitentiary at McAlester, and State Reformatory at Granite. The total expenditure for the maintenance of these institutions is about \$1,000,000 per year.

**POLITICS AND GOVERNMENT.** There were no elections for State officers, and interest in the election of November centred about the presidential campaign. Oklahoma is strongly Democratic, and there was no question as to the Democrats being able to carry the State. President Wilson received 148,626 votes, and Mr. Hughes 98,299. The Socialist candidate received an unusually large vote, 45,431. The Democrats had a substantial majority in both houses of the Legislature.

In September the attorney-general of the State filed a complaint against every refining company and oil corporation in the State. He declared that the advance from 17 cents a gallon for gasoline to 25 cents in September was in accordance with an "understanding," and therefore a violation of the Federal law.

**LEGISLATION.** The State Legislature met in special session during the year. Several measures of importance were passed. A constitutional amendment authorizing counties to abolish or resume the township form of government was adopted. The Legislature adopted a joint resolution proposing a new constitutional amendment, changing the description of persons excepted from the literacy test to those who have seen military or naval service, including service in any foreign nation, and their descendants. This action was due to the fact that the Supreme Court in 1915 pronounced unconstitutional the section of the State constitution known as the

grandfather clause, which in effect prevented the negroes of the State from voting. Provision was made for absentee voting in the State. The initiative and referendum relating to the distribution of publicity pamphlets was amended.

**STATE OFFICERS.** Governor, R. L. Williams; Lieutenant-Governor, M. E. Trapp; Secretary of State, J. L. Lyon; Treasurer, W. L. Alexander; Auditor, E. B. Howard; Adjutant-General, F. M. Canton; Attorney-General, S. P. Freeling; Commissioner of Insurance, A. L. Welch; Commission of Education, R. H. Wilson; Commissioner of Agriculture, F. M. Gault—all Democrats.

**JUDICIARY.** Supreme Court: Chief Justice, Matthew J. Kane; Associate Justices, John B. Turner, J. F. Sharp, Summers Hardy, and Charles M. Thacker; Clerk of the Court, William M. Franklin.

#### STATE LEGISLATURE.

	Senate	House	Joint Ballot
Democrats .....	88	85	123
Republicans .....	5	26	31
Socialists .....	1	0	1
Democratic majority ...	32	59	91

**OKLAHOMA, UNIVERSITY OF.** A non-sectarian co-educational institution at Norman, Okla., founded in 1892. In 1916 there were 2500 students and 147 faculty members. From all sources the university drew an income of \$253,500. The library contains 24,500 volumes. President, Stratton Duluth Brooks.

**OLD-AGE PENSIONS.** During the past few years there have been various attempts made by persons interested in social and labor legislation to promote the establishment in the United States of old-age pension schemes by civil authorities and also by private corporations. Every advanced country in the world except this country has enacted some form of public old-age pension scheme whereby members of the working classes upon arrival at age 65 or 70 may retire with an assured pension sufficient to obviate the necessity of public relief. Such pensions are usually provided from funds to which the beneficiary makes a contribution along with his employer and the state; in England they are provided entirely from the public treasury. In the United States most of the civil authorities have made provision for the retirement of their own employees, but thus far provision for the old-age incapacities of industrial employees has been made only here and there by the larger corporations. Corporation retirement systems, however, have now become numerous, including as they do every railway system of importance, and the great banking, telephone, telegraph, manufacturing, and commercial firms. The most serious defect, however, with the American plan of leaving the establishment of old-age pensions to private initiative is that the vast majority of the lowest paid workers who are most liable to require public assistance in old age are not included. It is for this reason primarily that social workers and insurance enthusiasts maintain that a universal compulsory system provided by public authority is the only proper solution. Moreover, the predominant opinion in this country has been that such a system should require contributions from the bene-

ficiaries and from employers to be supplemented and administered by the State.

**CONGRESSIONAL ACTION.** During the last session of Congress a group of social workers and insurance experts appeared before the House Committee on Labor in favor of Federal old-age pensions. Dr. Royal Meeker, chief of the United States Bureau of Labor Statistics, pointed out that even Turkey is ahead of the United States in this field of legislation. Miles M. Dawson, a well-known insurance expert, testified that since adopting sickness insurance and old-age pensions, Germany has added 12 years to the average life of her working population. State Insurance Commissioner Potts of Illinois declared that the "insurance monopoly" was fighting the creation of government insurance funds. Various others, including Dr. I. M. Rubinow of New York, J. P. Chamberlain of Columbia University, and Insurance Superintendent Nesbit of the District of Columbia, testified that the present means of dealing with sickness, unemployment, and old-age disability in this country were totally inadequate to the need.

**OHIO.** An Ohio Old-Age Pension League was formed during the summer at Columbus to launch a movement for securing old-age pensions in the State. All sections of the State sent representatives to the organization of the league. The conference decided to initiate a bill with the following main features: an age limit of 65 years; persons with an income of less than \$240 a year from other sources to be eligible; property holdings to the amount of \$1500 to be exempted in computing income; 5 per cent per annum of the value of real estate in excess of \$1500 to be regarded as income; inmates of public institutions to be ineligible; juvenile or probate courts to have charge of the administration; inheritance taxes to be the chief source of the revenues; and the maximum annual pension to be \$240. As Ohio has the indirect initiative the bill will have to be presented to the State Legislature accompanied by signatures of 3 per cent of the voters. Then in case the Legislature does not act upon it or rejects it, the bill will be placed upon the ballot at the next general election providing 3 per cent of the electors petition again. The league plans to present the bill at the meeting of the Legislature in January, 1917.

**PROTESTANT EPISCOPAL CHURCH FUND.** On March 1st a committee of this church headed by Bishop William Lawrence of Massachusetts began a campaign for \$5,000,000 as basis for a retirement fund for Protestant Episcopal ministers. Late in December it was announced that \$4,000,000 had been raised and that the fund would be completed by March 1, 1917. It will be used primarily to give pensions to ministers voluntarily retiring at age 68. The pension in each case will equal  $1\frac{1}{4}$  per cent of the average salary received during past years of service multiplied by the number of years service, but in no case less than \$600 nor more than one-half the average salary. In addition the fund will supply a basis for disability pensions ranging from \$600 to 40 per cent of the average salary during the last five years preceding disability; widows' pensions ranging from a minimum of \$300 to one-half the husband's pension; and orphans' benefits. These latter will be as follows: orphans under age 7, \$100 per year; those 7 to 14, \$200; those 14 to 21, \$300.

**WELLS FARGO PLAN.** On June 1, 1916, a pension system affecting more than 15,000 employees was announced by the Wells Fargo Company. The plan provides for contingencies ranging from sudden death to disability and old age, and was formed because the pre-existing pension system was found to be inadequate to meet the needs of modern life. The clause touching old-age pensions provides that an employee who has been 40 years in the service and is 60 years of age may retire at his own request and be pensioned. Also if an employee be 70 years of age and has had 25 years of service he may receive a pension. After being 25 years in the service if he be incapacitated for further work he receives a pension regardless of age. The amount of pension is based on pay received at the time of retirement and no employee may receive less than \$30 or more than \$125 a month. Also a pensioned employee will not be debarred from engaging in other occupations not prejudicial to the company.

**GREAT BRITAIN.** The government decided August 30th to make an additional allowance not exceeding half a crown per week to special cases of old-age pensioners. In doing this the government responded to prolonged agitation concerning the hardships suffered by old-age pensioners because of an increase in the price of necessities.

**GERMANY.** A resolution favoring the reduction of the age limit in the case of old-age pensions was unanimously adopted by the Reichstag January 15th. The resolution provided that the age limit be reduced from 70 to 65 years.

**HOLLAND.** At the opening of the Dutch Parliament in April, a motion was made by one of the deputies to strike the old-age pensions bill from the governmental programme on the plea that it was of a controversial nature and thus militated against the unity which was so necessary because of the danger threatening its warring neighbors. But leading statesmen having shown that conditions were not such as to necessitate the discontinuance of the bill the motion was rejected by a good majority.

**REFERENCES.** Aspects of old-age pensions are treated in the following publications of 1916: J. A. Hensey, *Poverty and Preaching* (refers to superannuation of ministers); H. J. Hoore, *Old-age Pensions; Their Actual Working and Ascertained Results in the United Kingdom* (1915); National Civic Federation, *The Problem of Pensions; Federal, State, Municipal, and Industrial*. **OLDHAM, WILLIAM F.** See **METHODIST EPISCOPAL CHURCH.**

**OMAN.** An independent Mohammedan state in southeastern Arabia under a sultan, subsidized by the Indian government, which retains a political agent at his court. Estimated area, 82,000 square miles; estimated population, 500,000. The capital is Muscat; its population, including that of the adjacent Muttra, is about 25,000. Imports in 1914-15, 4,914,177 rupees, and exports, 4,124,093 rupees; in 1913-14, 6,116,520 rupees and 4,073,044 rupees. These figures are only for sea-borne trade; in addition, there is a large unrecorded caravan trade with the interior. Reigning sultan, Seyyid Timar bin Faisal, who was born in 1886 and succeeded his father, Seyyid Faisal bin Turki, on Oct. 5, 1913.

**ONE DIMENSIONAL GAS.** See **PHYSICS.**

**ONTARIO.** The second largest province of the Dominion of Canada, extending from Quebec westward to Manitoba. The capital is Toronto. Area, 407,262 square miles, of which 41,382 water. This area includes that portion of the Northwest Territories annexed to Ontario in 1912. Previously the area of the province was 260,862 square miles; between 1901 and 1911 the population of this area increased 15.58 per cent, or from 2,182,947 to 2,523,274. In 1911 Toronto had 376,538 inhabitants, being the largest city after Montreal in Canada; Ottawa, capital of the Dominion, 87,062; London, 46,300; Brantford, 23,132; Kingston, 18,874; Peterborough, 18,360; Windsor, 17,829; Fort William, 16,499; Berlin, 15,196; Guelph, 15,175; St. Thomas, 14,054; Stratford, 12,946; Owen Sound, 12,558; St. Catharines, 12,484; Port Arthur, 11,220; Sault Ste. Marie, 10,984; Chatham, 10,770; Galt, 10,290. Of the population 10 years of age and over in 1911, males numbered 1,043,188 (51.75 per cent) and females 974,632 (48.25); of these, 836,135 males and 154,878 females were reported as employed in gainful occupations. Of the males employed, 36 per cent were in agriculture, 22 per cent in manufacturing, 10.8 per cent in trade and merchandising, and 10 per cent in building trades; of the females, 33.8 per cent were in personal and domestic service, 30.7 per cent in manufacturing, 14.5 professional, and 13.8 in trade and merchandising.

The provincial government is administered by a lieutenant-governor, appointed for five years by the Governor-General of the Dominion; he acts through an executive council, or responsible ministry, of 10 members. The legislative assembly is unicameral and consists of 111 members elected by manhood suffrage for four years. In the twelfth Parliament, which convened in 1911, Ontario was represented by 24 Senators and 86 members of the House of Commons; the representation in the Commons on the basis of the 1911 census is 82. The Lieutenant-Governor in 1916 was Col. Sir John Strathearn Hendrie, appointed Sept. 26, 1914, in succession to Col. Sir John Morison Gibson.

**OPEN-AIR PERFORMANCES.** See CELEBRATIONS; DRAMA; MUSIC, *Festivals.*

**OPERA.** See MUSIC.

**OPERA-COMIQUE.** See MUSIC, *France.*

**OPERATIONS.** See SURGERY.

**ORANGE FREE STATE.** An original province of the Union of South Africa. See SOUTH AFRICA, UNION OF.

**ORCHESTRAS.** See MUSIC.

**ORDNANCE.** See MILITARY PROGRESS.

**ORE DEPOSITS.** See GEOLOGY.

**OREGON. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 848,866. The population in 1910 was 672,765.

**AGRICULTURE.** The acreage, production and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16, were as follows:

	Acreage	Prod. Bu.	Value
Corn . . . . . 1916	40,000	1,340,000	\$ 1,273,000
1915	33,000	1,155,000	947,000
Wheat . . . . . 1916	850,000	19,550,000	28,347,000
1915	900,000	20,025,000	16,821,000
Oats . . . . . 1916	360,000	17,280,000	8,467,000
1915	365,000	16,080,000	5,942,000
Potatoes . . . . . 1916	55,000	8,250,000	7,425,000
1915	48,000	5,520,000	3,312,000
Hay . . . . . 1916	850,000	1,955,000	\$1,810,000
1915	850,000	1,870,000	17,765,000

	Acreage	Prod. Bu.	Value
Rye . . . . . 1916	30,000	510,000	586,000
1915	23,000	414,000	373,000
Barley . . . . . 1916	140,000	5,890,000	4,812,000
1915	130,000	4,680,000	2,902,000

a Tons.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments . . .	2,246	2,320
Average number of wage earners . . . . .	28,750	28,829
Capital invested . . . . .	\$89,082,000	\$189,500,000
Wages . . . . .	19,902,000	20,981,000
The value of materials used . .	50,552,000	68,258,000
Thee value of products . . . . .	93,005,000	109,762,000

**MINERAL PRODUCTION.** The total output of gold in the State in 1915 was valued at \$1,861,796, compared with a value of \$1,591,461 in 1914. The silver production was 117,947 ounces valued at \$59,799, a decrease of 24,605 ounces in quantity. The copper output in 1915 was 451,172 pounds, compared with 39,248 pounds in 1914. There were produced in 1915 62,957 pounds of lead, compared with 16,436 pounds in 1914.

The preliminary estimates of the value of the metals mined in the State in 1916 showed an increase over 1915 for gold, silver, and copper and a decrease for lead. The output of gold in 1915 was \$1,861,796, and for 1916 \$1,900,000. The output of silver in 1915 was 117,947 ounces, and in 1916 227,500 ounces. The copper output of 1915 was 451,172 pounds, and in 1916 2,527,000 pounds, or an increase of 2,075,828 pounds. The lead output was 62,957 in 1915, compared with 22,000 pounds in 1916.

The output of gold in the State in 1916 was about the same as in 1915. There was a revival of activity in the hydraulic mining industry of the State, particularly in the counties along the northwestern border. Many old properties were reopened, and many new ones were put in condition for working.

**TRANSPORTATION.** The total mileage of main lines in the State on June 30, 1916, was 2860. The roads having the longest mileage are the Oregon-Washington Railroad and Navigation Company, 967; the Oregon and California, 680; the Southern Pacific, 356. The Southern Pacific in 1916 constructed 118 miles from Eugene to North Bend, the Oregon-Washington Railroad and Navigation Company, 33 miles from River-side to Crane.

**EDUCATION.** The total school population of the State in 1916 was 209,028. The total enrollment in the public schools was 142,365, with an average daily attendance of 127,692. There were 6173 teachers, of whom 1207 were male, and 4966 female. The average monthly salary of male teachers was \$87.14, and of female \$63.61. During the past year the most important work in education has been the standardizing of the high schools of the State. In 1915 the superintendent of public instruction appointed a committee of high school principals to determine what should be required of a high school in order that its courses might be considered standard. After sev-

eral months of investigation the committee filed a report which is used as a basis for standardization. At the opening of the school year 1915-16 there were 167 four-year standard high schools in the State. Throughout the year school districts have been working steadily to have their schools placed on the official list. There will be 180 schools meeting all the requirements.

**FINANCE.** The receipts for the two years ending Sept. 30, 1916, amounted to \$12,044,354, and the disbursements to \$11,473,469. There was cash on hand on Oct. 1, 1914, of \$567,917, and on Sept. 30, 1916, of \$1,138,802. There is no State debt.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include the Oregon State Hospital at Salem, the Eastern Oregon State Hospital at Pendleton, the Oregon State Penitentiary at Salem, Institute for the Feeble-Minded, Oregon State Training School, Oregon State Tuberculosis Hospital, the Oregon State School for the Blind, Oregon State School for the Deaf, the Oregon State Industrial School for Girls, all at Salem, and the Oregon State Soldiers' Home at Roseburg.

**POLITICS AND GOVERNMENT.** A novel phase of the Oregon presidential primary law attracted wide attention prior to the primary election May 19th. Taking advantage of the provision for placing the names of candidates upon the ballot by petition, a petition proposing Charles E. Hughes, then Associate Justice of the Supreme Court, for President, was circulated without his consent or authority. In response to a protest from Mr. Hughes, the Secretary of State refused to heed the petition. The petitioners appealed to the courts and a ruling was obtained to the effect that a person's name may be placed upon the ballot by petition in spite of his objections. Consequently Mr. Hughes was formally a candidate for Republican presidential preference. Theodore E. Burton and Albert B. Cummins were avowed candidates. The party vote gave Mr. Hughes 58,764, Mr. Cummins 27,558, and Mr. Burton 10,593. This result pledged the Oregon delegation to the Republican National Convention, also chosen by the primary method, to Mr. Hughes. William Grant Webster, of Illinois, was the only person whose name appeared on the Republican ballot as a candidate for the vice-presidential nomination. He received 58,076 votes. There was no contest on the Democratic presidential ticket, the name of President Wilson appearing alone. Under the Oregon system no conventions to adopt platforms or nominate candidates are held. In the general election the State's electoral vote was given to Mr. Hughes by the following vote: Hughes, 126,969; Wilson, 120,125; Hanly, 4755; Benson, 9767.

Contests for other offices, except in two congressional districts, were largely perfunctory. The only State offices filled were those of secretary of State, dairy and food commissioner, two supreme judges, and two district public service commissioners. Republicans were elected. In the first congressional district W. C. Hawley was reelected, defeating Mark Weatherford, who had the Democratic and Prohibition endorsements. In the second district, N. J. Sinnott, incumbent, was opposed only by a Socialist candidate who received substantially his party vote. In the third district C. N. McArthur was reelected, defeating John J. Jeffrey,

Democrat, and A. W. Lafferty, Independent.

In 1916 Oregon women participated in their first presidential election. This contributed to increase the total vote of 137,040, cast in 1912, to 261,616. A slight diminishing influence on the total vote was caused by adoption in 1914 of an amendment making full citizenship a necessary qualification of voters. Previously aliens who had declared their intention to become citizens were qualified.

Eleven constitutional amendments and bills were submitted to the electorate. By a majority of 5252 importation of intoxicants for beverage purposes was prohibited. This constitutional amendment is supplementary to a previously adopted amendment prohibiting sale or manufacture within the State except for medicinal, scientific, or sacramental purposes. Under the statute passed to support the earlier amendment importation in limited quantities had been permitted for use in homes. Other measures adopted were the following: an amendment establishing a State rural credit system based on State bonds; an amendment empowering the Governor to veto single items in appropriation bills; an amendment exempting home-owned or home-registered ships from local taxation; an amendment limiting tax revenues levied in any one year to an amount not more than 6 per cent in excess of the total levied in the preceding year, and a bill repealing a Sunday "blue law." The voters defeated a bill to permit manufacture of malt liquors containing 4 per cent alcohol, a bill prohibiting compulsory vaccination, an amendment which combined full single tax with a home-owners' loan fund system, a bill establishing a second normal school, and an amendment designed to remove an inoperative section from the constitution denying the suffrage to negroes, mulattoes, and Chinese. Charges of fraud in circulation of initiative petitions incident to other elections recurred. A grand jury investigation failed to produce indictments but disclosed that the petitions which initiated the single tax proposal carried names of many persons whose addressee were illegible, names of others who could not be found, and that one sheet bore evidence of having been circulated among the prisoners in the county jail. There was no session of the Legislature in 1916.

**OTHER EVENTS.** The Sunday closing law enacted in 1864 was upheld by the United States District Court of Portland, Ore., in January. The law has for many years been regarded as obsolete, but recently the Portland Retail Grocers' Association upon learning of its existence, became active in its enforcement. Several grocers who kept their stores open on Sunday were arrested and some of them were fined. Under the law the only places allowed to do business on Sundays are undertaking establishments, bakeries, and hotels. On June 7th was celebrated the dedication of Columbia River highway, which is declared by experts in road engineering one of the greatest highways ever built to meet the condition of modern traffic. The scenic attractions along this road are not surpassed by any highway in the world.

**STATE OFFICERS.** Governor, James Withycombe; Secretary of State,\*\* Benjamin W. Olcott; State Treasurer, Thomas B. Fay; Superintendent of Public Instruction, J. A.

Churchill; Attorney-General, George M. Brown; Dairy and Food Commissioner,\*\* John D. Mickle; Labor Commissioner, O. P. Hoff; Adjutant-General, George A. White; Insurance Commissioner, Harvey Wells; State Engineer, John H. Lewis; Corporation Commissioner, Henry J. Schulderman; Public Service Commission, Thomas K. Campbell, \* Fred G. Buchtel, and \* H. H. Corey. All are Republicans.

JUDICIARY. Supreme Court: \*\* Frank A. Moore, Thomas A. McBride, Henry J. Bean, \*\* George H. Burnett, Robert Eakin, Henry L. Benson, Lawrence T. Harris; Clerk, J. C. Moreland—all Republicans.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Republicans .....	24	55	79
Democrats .....	5	4	9
Independents .....	1	1	2
Republican majority . . .	18	50	68

**OREGON, UNIVERSITY OF.** A co-educational State institution at Eugene, Ore. The School of Medicine is in Portland. The total enrollment in all departments in the fall of 1916 was 1579. The faculty numbered 128. The university has \$55,000 in productive funds which yielded \$4400 in 1916, but its principal income was \$270,000 from a millage tax. A land fund yielded \$6000. In the library are 68,000 volumes. President, Prince Lucian Campbell.

**ORNITHOLOGY.** The National Association of Audubon Societies continued its work for the spread of interest in birds, and legislation for their protection. About \$100,000 of income was spent by the society in 1915. Under the auspices of the New York Zoölogical Society, Beebe established at Demerara a tropical station for the study of bird evolution and the life histories of important species. The importance of the cat problem to bird lovers is emphasized by Forbush in a bulletin of the Massachusetts State Board of Agriculture, who pointed out the damage done to birds by cats which are allowed to run loose. Forbush insists that traps are more efficient than cats in exterminating rats and mice, and that cats should be licensed and kept under control just as dogs are.

An important agreement relating to bird protection was made between the United States and Canada and ratified by the United States Senate in August of 1916. This provides for the protection of insect feeding and game birds flying from the United States into Canada. In connection with the supposed benefits conferred by insect feeding birds on agriculture, it is interesting to note that this is regarded as much less important by entomologists than by ornithologists, the former holding that since birds do not discriminate between insects, they may, by eating forms that normally parasitize other insects, do more harm than good. See **ZOOLOGY**.

**OSBORN, HENRY FAIRFIELD.** See **GEOLOGY**.  
**OSBORNE, THOMAS MOTT.** See **PENOLOGY**.  
**O'SHAUGHNESSY, EDITH.** See **LITERATURE, ENGLISH AND AMERICAN, History, etc., American**.

**OTT, ISAAC.** An American neurologist, died

\* Elected 1916.

\*\* Relected 1916.

at Easton, Pa., Jan. 1, 1916. Born in Northampton County, Pa., in 1847, he spent three years at Lafayette College, graduated in medicine from the University of Pennsylvania in 1869, and later studied at Leipzig and Berlin. Afterward he practiced at Easton and in 1878 was appointed lecturer on physiology at the University of Pennsylvania. From 1894 he was connected with the Medico-Chirurgical College of Philadelphia as professor, and in 1895-96 as dean also. At one time he was president of the American Neurological Society. Among Dr. Ott's writings are: *Modern Antipyretics* (1892); *Contributions to the Physiology and Pathology of the Nervous System* (20 parts); *Text-Book of Physiology* (1904); *Internal Secretions* (1910); *Fever* (1914).

**OTTO,** former king of Bavaria, died at Fürstenried Castle, near Munich, Oct. 10, 1916. He was born April 27, 1848, and after his early education was completed, prepared for the life of a soldier. In the Franco-Prussian War he was attached to the staff of the Crown Prince of Prussia, but symptoms of insanity developed and he was recalled to Munich. He grew steadily worse, and in 1876 he was put under restraint in the Castle of Nymphenburg, being put under still more rigorous restraint two years later. On the suicide of his insane brother, Ludwig II, in 1886, Otto nominally succeeded to the throne, but the government was in the hands of his uncle, the Regent Luitpold. Under the regency Otto was removed to Fürstenried castle, where he was kept in confinement until his death. He was formally deposed on Nov. 5, 1913, and was succeeded by the regent, now Ludwig III. Like his brother Ludwig II, he was passionately fond of music.

**OUIZERO-ZEODITU.** See **ZEODITU, OUIZERO**.

**PACHMANN, VLADIMIR.** See **MUSIC, England**.

**PAGE, CARROLL SMALLEY.** Relected Republican United States Senator from Vermont, Nov. 7, 1916.

**PAGEANTS.** See **CELEBRATIONS; DRAMA; MUSIC; RUTGERS COLLEGE; YALE UNIVERSITY**.

**PAHANG.** A state of the Federated Malay States (q. v.).

**PAIN, BARRY.** See **LITERATURE, ENGLISH AND AMERICAN, Fiction, English**.

**PAINE, CHARLES JACKSON.** An American soldier and yachtsman, died at his summer home at Weston, Mass., Sept. 9, 1916. Born in Boston in 1833, he graduated from Harvard at 20, and three years later was admitted to the bar. In the fall of 1861 he became a captain of Massachusetts volunteers, and rose to be a colonel, resigning in 1864. For his services at the capture of Fort Fisher, having again entered the service as brigadier-general, he was brevetted major-general. After the war it was as a yachtsman that General Paine became internationally known. In 1884 he had the *Puritan* built to defend the *America's* cup against Sir Richard Sutton with his *Genesta*. In 1885 the *Mayflower* was built to meet the challenge of the *Galatea*, and later the *Volunteer* defeated the *Thistle*. All these American yachts which had been sailed with such success were built by Edward Burgess, but General Paine was largely responsible for the designs. After Mr. Burgess's death, General Paine entered the *Jubilant*, designed by his son, after the *Thistle II*

had challenged, but it was eliminated in the contest among several competitors for the place of defender. General Paine acquired important railway interests in the West, and in 1897 was one of three envoys sent abroad to further the cause of international bimetalism.

**PAINTING AND SCULPTURE.** The artistic events of the year 1916 showed a state of affairs which has never before existed. As a result of the great European war the centre of artistic activities, both productive and commercial, changed from Europe to New York. The lack of artists' work from abroad caused unusual emphasis to be placed upon native work. Beyond this, no perceptible effect of the war upon art was visible. A distaste for martial subjects in art may be the ultimate result, for those who have experienced the hardships and horrors of modern warfare will hardly be eager to find inspiration in it. But a deeper spiritual and moral awakening, making itself felt in the more serious and devoted attitude to the highest ideals in art, should be the natural outcome.

The increasing prevalence of exhibitions of the work of a single artist and the constant expansion of the judicious "group-system" in exhibiting were interesting features of art shows of a non-official nature. Although the Cubists and Futurists were not as much in evidence as in previous years, the ultra-modern movement was viewed in an exhibition of the Vorticists in a New York club. On the other hand, exhibitions of works by the followers of the post-impressionist movement were frequent, and found earnest interpreters and appreciative patrons. An increasing interest on the part of the general public in works of art, contemporary and old masters, and an eagerness to visit the exhibitions in museums and in the constantly-increasing number of small, compact, well-appointed galleries, was observable.

The necrology list for the year included, among others, in America, William M. Chase, long a prominent and influential artist, the landscape painters, William Ranger and W. G. Bunce, the portraitists, Charles N. Flagg and Thomas Eakins, and the talented sculptor, Edith Woodman Burroughs; in France, the veteran landscape painter, Harpignies, the gifted mystic, Odilon Redon, and the sculptor Mercié. See separate articles on all these artists except Bunce, for whom see **NECROLOGY**.

**ARCHITECTURAL LEAGUE EXHIBIT.** This exhibition, held in January, presented an unusually ingratiating appearance in 1916, owing to the garden-like effect of the decorations of the Academy rooms, with gravel paths, softly plashing water, and blue cloth sky. In the Academy room were placed the exhibits of the American school in Rome, including the result of the collaborative competition, won by John Gregory, Kenneth Carpenter, and Eugene Savage. Interesting were the reconstructed plans of the vatican palace, after Bramante's original designs, by Kenneth Carpenter and a fresco revival in the panel by Eugene Savage.

In the south gallery were exhibited the decorative studies by Violet Oakley for the Governor's room at the capitol, Harrisburg, and her projected "Dante" window. Other effective studies for proposed decorations were exhibited by Robert K. Ryland, Hugo Ballin, and W. H. Henderson. Exotic color studies of tropical seas by Stephen Haweis and Robert Chanler, and a lively

frieze of dancing figures by W. T. Benda lent color to the walls. Dainty and sprightly in movement was the panel contributed by T. G. Sommers, while the large "Noon" by Arthur Crisp showed both breadth of space composition and lightness of touch. Nor should Mrs. Magonigle's intricately patterned panel designs, especially "The Falconess," be overlooked.

**PENNSYLVANIA ACADEMY EXHIBIT.** The one hundred and eleventh exhibition at Philadelphia upheld in every respect its usual high standard, and a number of paintings by artists lately returned from abroad helped to add a new note to the carefully arranged walls. In all, 439 paintings and 217 pieces of sculpture were on view. Joseph T. Pearson received the Temple gold medal and the Stotesbury prize for the decorative "In the Valley," a study of wild geese; Emil Carlsen, the Jennie Seanan gold medal for the carefully wrought "Entrance to St. John's Harbour." The portrait of Dr. Felix Adler by Douglas Volk, belonging to the Metropolitan Museum, received the Carol Beck medal. Karl Anderson's highly personal canvas, "The Heirloom," and "In Provincetown" by Nancy Smith also received prizes. The G. D. Widener sculpture prize went to Edward McCarten for the charmingly imaginative "Spirit of the Woods." Marie D. Page's "The Mother" offered an interesting contrast in the austere treatment of the mother's face and the soft, downy head and indefinite features of the nestling infant. Two early interesting pictures by John S. Sargent and Mary Cassatt were noteworthy. "Sunlight and Shadow," a 20-year-old canvas by the late W. M. Chase, in its quiet reticence and sound technique more than held its own, though juxtaposed with the energetic and sparkling marines of Carol Tyson. Among the many interesting portraits, special mention should be made of that of Hervey White by Eugene Speicher; Leopold Seyffert's strong "Hans Kindler," and Alexander Drake, by John Johansen. A group of pictures by J. Alden Weir showed at his best this mellow and finished artist, while Hugh H. Breckenridge's "Nude" gave an almost metallic impression. The usual number of pleasing landscapes by artists of established reputations were not missing.

**NATIONAL ACADEMY, SPRING EXHIBITION.** The efforts of the new administration bore fruit of an agreeable character in the distribution and hanging of the paintings of the spring exhibition of the National Academy of Design 513 in all, of which 143 were miniatures. The pleasing lack of the usual overcrowding, and the absence of surplus portraiture gave the spectator more opportunity to enjoy the really fine examples exhibited. Such a one was J. Alden Weir's young woman entitled "A Disciple of Grolier," treated with sensitive reserve and delicacy. The two compositions of young women by Ivan Olinisky displayed fine personal feeling and balanced workmanship. Louis Bett's vigorous portrait of Ben Foster, and the dashing "Miss Bonnie Glass," a study in white by Ben Ali Haggin, deserved special notice. William T. Smedley's prize-winning portrait of "Miss C. B. R." showed progress in the mastery of warm, rather thick color. The collection of landscapes was of the usual aspect, with perhaps a leaven of the new movement perceptible. The luminous and finely balanced "Moonlight," a marine by Emil Carlsen, received the Saltus medal. The first

Altman prize and the Inness gold medal went to Charles Rosen for his "Winter Sunlight," an expressive and careful work. Ernest Lawson's two contributions showed the rich and delicate color and individual interpretation of this talented artist, who received the second Altman prize for the "Pigeon Coop." The arresting figure piece, "The Peacock Girl," by E. F. Church, received the Thomas B. Clarke prize, and a highly decorative composition, "The Strollers," brought the first Hallgarten prize to Arthur Crisp. The unassuming "Interior of a Wood" by John Carlsen possessed fine color and breadth of treatment, and the small and unobtrusive little canvases, easily overlooked, but rich in content, offered by Walter Goltz, Jerome Myers, and Eugene Higgins, should not be forgotten. The contribution of F. Luis Mora, a huge "Fantasy of Goya," while displaying an ambitious imagination, brought its author slightly beyond his depth. The usual expected and firm foundation of all academic exhibitions was there in characteristic pieces by Bruce Crane, J. Francis Murphy, Walter Palmer, Ben Foster, C. H. Davis, Carleton Wiggins, and Leonard Ochtman. The carefully composed and intellectually conceived work of Kenyon Cox and Sargent Kendall, and the academic but richly colorful creations of Hugo Ballin, acted as ballast to hold down the more flighty outpourings of the youthful exhibitors. Their impetuous strivings, on the other hand, contrasted refreshingly with the carefully carried out, seldom-varied color recipes of such men as Gardner Symons, Elmer Schofield, Edward Redfield, and others.

**PITTSBURGH EXHIBIT.** The international exhibition at the Carnegie Institute, Pittsburgh, omitted last year because of the Panama-Pacific Exposition, was in 1916 devoted entirely to the works of foreign artists, brought directly from San Francisco. They have been noted in connection with the Exposition in the *NEW INTERNATIONAL YEAR BOOK OF 1915* (q.v.). The paintings of the Swedish section were afterwards on view at the Brooklyn Institute and other museums, and exhibitions of some of the French and English works were held in New York galleries.

**CORCORAN ART GALLERY EXHIBIT.** Two noteworthy features stood out in viewing the sixth exhibition by contemporary American artists at the Corcoran Art Gallery, Washington, which opened December 17th. The first was that the invited list included names of the exponents of advanced modernist ideas. The paintings of Samuel Halpert, Henry McFee, and Andrew Dasburgh formed an interesting group among works of the expected character. The other feature of interest was the inclusion among the awards of artists in the advance guard of the younger school. Arthur Davies carried off the first W. A. Clark prize and Corcoran gold medal with his fine and stimulating canvas "Castalías"; the other prizes went to Ernest Lawson, Hugh Breckenridge, and George Luks. Two canvases by William Glackens well portrayed that artist's subtle mastery of glowing color, and Allen Tucker's broad, embracing treatment of nature was well exemplified in his "Albany Intervale." Other paintings which harmonized with these in freshness of endeavor and execution were by Leon Kroll, Rockwell Kent, John Sloan, and Eric Hudson.

Several important portraits and other works

by John Singer Sargent were collected in a small special room. In others hung representative examples by the late W. A. Chase, Cecilia Beaux, Douglas Volk, Lydia Emmet, and George Bellows, besides graceful and distinguished study portraits by J. Alden Weir and Frank Benson. Other artists, whose works, quite in their usual vein, always offer renewed pleasure and profit in contemplation, were Ben Foster, Childe Hassam, Elmer Schofield, Gifford Beal, Jonas Lie, Robert Henri, Leopold Seyffert, and Charles Hopkinson.

**CHICAGO ART INSTITUTE EXHIBIT.** The twenty-ninth annual exhibition of American painting and sculpture at the Art Institute, held in November, assumed an unusually festive air in 1916, owing to the fact that it took place, for the first time, in new, admirably appointed galleries. A representative group of over 300 paintings occupied the upper galleries, while the lower floor contained a large and comprehensive display of sculpture, including works by Lorado Taft, Bela Pratt, Herbert Adams (with 17 pieces), Charles Grafly, Anna Hyatt, the late Edith Woodman Burroughs, Sherry Fry, the late Karl Bitter, and Albin Polasek, who is the newly appointed head of the Institute school of sculpture. The Potter Palmer gold medal and prize was awarded to Emil Zettler for his forceful statue "Job." "The Hammock," by Frederick Frieseke, received the first Norman Wait Harris prize, and "Mountain Courtship," by James P. Hopkins, the second. The Martin R. Cahn prize went to Walter Ufer. Well-known Western artists were adequately represented, together with works by Eastern men, already familiar through other exhibitions.

**NATIONAL ACADEMY, WINTER EXHIBITION.** Comparative bareness of the walls and really commendable results in the grouping of the pictures were noticeable on entering the galleries of the winter exhibition of the National Academy. As usual, through limited space, only about two-thirds of the accepted pictures could be placed, 381 paintings in all, of which 218 were by non-members. Western artists, and others lately returned from abroad because of the war, helped to swell the ranks of the familiar exhibitors. On the whole, the impression gained was one of usual competency, likewise well-ordered respectability. Few manifestations of revolutionary tendencies were visible to enliven the outlook. The awards were quite in line with the usual policy of the Academy. To Lawton Parker, the Chicago artist, fell the first Altman prize and Inness gold medal for his large painting of a handsome nude, good in color, conventional in composition. The second Altman prize was awarded to Irving Couse for a well-composed Indian group, carefully placed upon a pedestal, as it were, and with an unnecessarily sentimental appeal. The Thomas R. Proctor prize for the best portrait went to Philip Hale for a strong and forcefully conceived old sea-salt, "Cap'n Peter Turner," and "Maine Cliffs in Moonlight," a fine mellow work, brought the Carnegie prize to Howard Russell Butler. "Doris in the Parlor," a quaint child with staring eyes, painted with more sentiment than is usually perceptible in Mr. Bellows's clever work, was awarded the Isidor medal for the best figure composition of an artist under 35. Among the various portraits shown may be mentioned Marie D. Page's serious little girl, which won

the Julia D. Shaw Memorial prize, creditable efforts by Matilda Brownell, Lydia Emmet, Emil Fuchs, and Mary Foote; a minutely executed representation of Giuseppe Trotta by Sidney Dickinson and Karl Anderson's curiously indecisive group entitled "Sisters." Childe Hassam's favorite window theme was represented in a fresh and cheerful manner, while a highly illuminated nude study by Charles Hawthorne, of decidedly realistic trend, was a welcome effort to paint outside the sphere of "things unseen." A little interior by Helen Turner displayed much vivacity of color, and the "Oval Mirror" by Richard Miller pleased with its suavity and flowing line. An ambitious undertaking was Luis F. Mora's large canvas, "An Out of Town Trolley," which certainly showed as large a collection of widely divergent types as could be gathered together in one car at the same time. A commanding position was given to the late William M. Chase's early portrait of a lady in black, loaned by the Union League Club.

Characteristic landscapes were submitted by Ernest Lawson, Jonas Lie, Ben Foster, Gardner Symons, Albert Groll, John Carlsen, Daniel Garber, and other familiar artists. The most decisive note in the small sculpture exhibit was struck by the two highly interesting groups of Cecil Howard, in especially the "L'Après-Midi d'un Faune." The Elizabeth N. Watrous gold medal went to Herbert Adams's graceful "Nymph of Fynmere," and the Helen Foster Barnett prize to Laura Gardin Fraser. A few interesting portraits by Charles Hafner and Malvina Hoffman and others, and a number of small animal groups completed the sculpture exhibit.

**OTHER EXHIBITIONS.** Early in January an important exhibition of oil paintings and water colors by Cézanne was held in the Montross Gallery. Exhibitions of works by El Greco, Zuloaga, Van Gogh, and a benefit exhibit of Ralph Blakelock's landscapes, including his three famous "Moonlights," were held in New York galleries. A "Retrospective Collection of French Art" and a large exhibition of American sculpture, organized by the National Sculpture Society, were included in the activities of the Albright Art Gallery, Buffalo. Other exhibitions of sculpture at the Gorham galleries provided a field for a general survey of this kind. The "National Arts Club Prize" of \$1000, awarded at the club's exhibition in 1916 for the first time, was given to Ben Foster for "October," a typical product of American landscape painting, showing unusually fine feeling for composition.

**OTHER EVENTS.** A noteworthy event of the year was the opening, in Cleveland, of one of the largest and most beautiful art museums in the United States. It is built of white marble, on classic lines, and already possesses a nucleus of art treasures in early Italian, early American, and contemporary French paintings, and seventeenth century Flemish tapestries. As an exhibitor of the numerous traveling exhibitions of native and foreign artists, visiting the chain of museums across the country, it will take an important place.

**METROPOLITAN MUSEUM.** During the year the Metropolitan Museum of Art acquired the important "Colonna Madonna" by Raphael, a gift from Mr. J. P. Morgan; Regnault's famous "Salome," donated by Mr. George F. Baker,

and "Madame X," a tour de force of portrait painting, by John S. Sargent. Representative examples by Wilhelm Leibl, Max Liebermann, Hans Thoma, and Wilhelm Trübner were acquired with the fund left by the late Hugo Reisinger for the purchase of modern German paintings. The installation of the "Tomb of Perneb," the largest monument of the kind ever imported from Egypt, was an event of importance in the Egyptian department. A new department of Far Eastern art, organized under the able direction of Mr. S. C. Bosch-Reitz, was opened with an exhibition of ancient Chinese sculpture and pottery. The collection of ancient pottery exhibited was the finest of its kind ever assembled in the Western world. Here for the first time the American student could obtain a comprehensive idea of these wares: the stately T'ang (A. D. 618-907) ware, with its noble forms and Greek reminiscences; of the different varieties of the multi-colored Sung (A. D. 960-1280) ware, including the white and creamy Ting; the etched and tinted Tzu-chou ware; the wonderfully tinted Chün ware, particularly the gorgeous purples and reds; the ancient celadons, both Sung and Korean.

The educational activities of the museum showed decided growth. A number of courses were offered by the members of the museum staff and outside lecturers. The School Art League for the promotion of the knowledge and appreciation of art in the public schools offered lectures and instruction. Largely attended courses, treating the art objects of the museum from the originals, were offered by the Extension Department of Columbia University. The schools of decorative design of New York held regular sessions in the museum galleries and the workers in fine and applied design made increased practical use of the different departments of the museum. Similar work, though on a less extensive scale, was carried on in other museums, as at Boston, Chicago, Toledo, Cincinnati, Buffalo, Worcester, and elsewhere.

**SARGENT AND BARTLETT.** Important in the annals of American mural decoration was the placing in position in the Boston Public Library of six lunettes, by John S. Sargent. These new additions, which almost complete the original scheme of decoration, give a general impression of rich beautiful color and grandiose conception. The subjects, illustrating phases of Jewish and Christian faith, include such titles as the "Messianic Era," "Law," "Judgment," and "Gog and Magog." In the field of civic sculpture note should be made of the completion of the impressive pediment group for the house wing of the national capitol, by Paul Bartlett. The subject, "Life and Labors of the People," is embodied in a large central group, "Peace Protecting Genius," flanked on either side with symbolic representations of agriculture and industry.

**ART SALES.** The public sales of important private collections held during the year were on an unprecedented scale. They included the large Catholina Lambert collection of old and modern paintings, from which the Brooklyn Institute Museum acquired an imposing altarpiece attributed to Luini; the Hugo Reisinger collection of modern paintings; and the Davanzati Palace and Villa Pia collections of Italian Renaissance furniture, sculpture, and paintings, belonging to Prof. Elia Volpi. Important pur-



chases of old masters included two life-size marbles by Donatello, a figure "David," and a youthful bust of "St. John," acquired by Mr. J. E. Widener of Philadelphia. These two marbles, splendid examples of the master's art, had been in the possession of the Martelli family, Florence, for over four centuries. Other important purchases were: Gainsborough's "Mall," by Henry C. Frick; a Rogier van der Weyden, once in possession of Queen Isabella of Spain, purchased by Michael Dreicer; and five of Van Dyck's masterpieces from the Earl of Denbigh's collection, which were purchased by a New York art firm.

**ART ABROAD.** In England the customary Royal Academy exhibitions appeared to be unusually dreary and uninteresting. Many of the paintings showed war subjects, but were lacking in originality or force. Public art activities were completely suspended. Similar conditions prevailed, to a large extent, in France. In Germany conditions seemed more normal, with the fairly regular appearance of art publications and the usual activities of sales and exhibitions. Stirring lithographs by both French and German artists constituted perhaps the most important output. The discovery of a "Christ" attributed to Mantegna, and now in the Modena Gallery, was probably the most important art event in Italy.

See UNITED STATES NATIONAL MUSEUM.

**PALMER, ALICE FREEMAN.** See LITERATURE, ENGLISH AND AMERICAN, *Poetry*, American.

**PANAMA.** A republic situated between Costa Rica and Colombia. Formerly a department of Colombia, it declared its independence Nov. 3, 1903. The city of Panama, on the Pacific coast, is the capital.

**AREA AND POPULATION.** The estimated area is 87,480 square kilometers (33,776 square miles). This area will be somewhat reduced if the Costa Rica boundary is finally delimited in accordance with the decision (announced in 1914) of Chief Justice White of the United States Supreme Court, to whom the boundary dispute had been submitted—a decision which Panama refused to accept. The population of the republic (exclusive of the Canal Zone) is probably about 375,000. The estimated population of the city of Panama was 60,000 in 1915, and of Colón 30,000. Other important towns are David and Bocas del Toro. The Canal Zone is American territory, extending to a width of five miles on either side of the middle of the Panama Canal, but excluding the cities of Panama and Colón. The population of the Canal Zone was reported in 1916 at 31,048; the military numbered 7451 and civilians employed by the canal 11,742, of whom 3598 were Americans.

**PRODUCTION, COMMERCE, ETC.** The resources of the country are developed only to a small extent. There is much fertile soil, but the proportion under cultivation is not large. The forests contain some mahogany and other valuable woods. Various mineral deposits are reported, but they are not worked to any considerable degree. Manufacturing is unimportant. The chief crop is bananas; other products of some account are corn, sugar cane, cacao, tobacco, yams, coffee, coconuts, and rubber. Cattle raising is carried on with some success.

Imports (exclusive of non-dutiable supplies for the Panama Canal) and exports have been valued as follows:

	1912	1913	1914	1915
Imps. . . . .	\$9,871,617	\$11,397,000	\$9,885,447	\$9,805,447
Exps. . . . .	2,064,648	5,888,027	3,800,517	.....

Imports come largely from the United States, while the great bulk of the exports go to that country. Trade by countries, in thousands of dollars:

	Imports		Exports	
	1914	1915	1914	1915
United States . . . . .	6,896	7,023	2,270	3,863
United Kingdom . . . . .	1,886	1,175	110	.....
France . . . . .	218	180	2	.....
Germany . . . . .	460	10	126	.....

Principal exports to the United States in 1915: bananas, \$2,197,250; balata, \$328,662; coconuts, \$251,086; hides, \$183,322; ivory nuts, \$102,800; ipecac, \$90,043; tortoise shell, \$37,634; cacao, \$32,671; and rubber, \$23,373.

The city of Panama has rail connection with Colón, 48 miles; this is the Panama Railway, owned by the United States government. On April 21, 1916, the first passenger train ran from David to Boquette, 56 miles. There is also service over the branch from David to Concepción, 18 miles, and from David to Pedregal, the Pacific terminus. In the Bocas del Toro region, light railways, chiefly for the banana industry, aggregate upwards of 150 miles. On the Chirique Railroad 40 miles of line were completed between the port of Pedregal and Boquette and on the branch connecting Porterillos and Concepción. Dock No. 7 at Cristobal for the Panama Railroad was completed at a cost of \$1,400,000. At this place the laying of the remainder of the track for the new railroad yard was begun late in the year, the work having been delayed by the non-arrival of railroad ties from the United States.

Telegraph offices, about 40; post offices, about 100.

**FINANCE AND GOVERNMENT.** The standard of value is gold; the monetary unit is the balboa, equivalent to the American dollar. For the two-year period 1915 and 1916, the budget balanced at \$10,622,000.

The president is elected for four years by direct vote and is ineligible for the next term. He is aided by a cabinet of five members. Three designates are chosen by the National Assembly to succeed, in order, to the executive power in case of absence or disability. The National Assembly, which exercises the legislative power, is a single chamber of 33 members, elected by direct vote for four years. The president for the term beginning Oct. 1, 1916, is Ramón M. Valdez, who succeeded Belisario Porras. Designates: first, Ciro L. Urriola; second, Ramón F. Acevedo; third, Pedro A. Díaz. Each of the provinces is administered by a governor appointed by the president.

**HISTORY.** Contending that the United States was by treaty stipulations under obligation to supervise elections, the Conservatives and a portion of the Liberal party headed by former Vice-President Chiari, petitioned the United States government early in March to supervise the presidential election which was to take place in July. They argued that a fair election was impossible since the election machinery and the police were under the control of the followers

of former President Porras, who were supporting Dr. Ramon Valdez, and who were said to be hostile to American supervision. On May 14th the United States government demanded the surrender of the rifles of the Panama police. They were delivered and ordered to be sent to the Panama consul in New York and were to be sold there. A number of Panama citizens protested against this disarming of the police. During the presidential election, June 25th, riots occurred in which three persons were killed. Former Vice-President Dr. Ramon Valdez, the government candidate, who had at one time been minister to the United States, was elected president.

**PANAMA-CALIFORNIA EXPOSITION.**  
See EXPOSITIONS.

**PANAMA CANAL.** As a result of slides in the Culebra cut in September, 1915, traffic through the canal was cut off until March 27, 1916, when two United States supply ships with light draught passed through. Regular traffic was resumed through the canal on April 15th, when 16 ships, 7 northbound and 9 southbound, passed through. On May 11th, Major-General Goethals announced that on June 1st he would resign as governor-general of the Canal Zone.

By the 1st of September a large number of steamship companies had established regular services through the canal. These included four services from the Atlantic terminus, through Central and North America; three from the Atlantic coast of the United States to the Pacific coast of South America; four from Europe to the Pacific coast of South America; four from Europe to the west coast of North America; nine from the Atlantic coast of the United States to Japan, Siberia, China, and the Philippines; six from the Atlantic coast of the United States to Australia and New Zealand; and two from Europe to Australia and New Zealand.

On August 14, 1916, two years of service of the canal were completed. It was opened to commercial traffic on Aug. 15, 1914. During the two years a total of 2097 ships passed through the canal, an aggregate tonnage of 7,046,407. These vessels carried cargoes amounting to 9,031,613 tons, of 2240 pounds. Of the ships passing through 1055 passed from the Atlantic to the Pacific, and 1042 from the Pacific to the Atlantic. The second year had only 59 per cent as many ships as the first, 53.5 per cent as much net tonnage, and 52.8 per cent as much cargo. This decrease was caused by the fact that the canal was closed approximately one-half the period during the year Aug. 15, 1915, to Aug. 14, 1916.

**PANAMA-PACIFIC EXPOSITION.**  
See EXPOSITIONS.

**PAN-AMERICAN SCIENTIFIC CONGRESS.** This Congress, the second to be held, convened in Washington on Dec. 27, 1915, and its session continued through the first two weeks of January, 1916. There were present many of the most distinguished scientists, educators, and publicists of the United States and of the Central and South American states. Eduardo Suarez, the ambassador from Chile to the United States, was the president of the congress. The purpose of the meeting was the correlation and exchange of new views where they had a bearing on Pan-American science, art, and conduct of human affairs generally, with an aim of furthering the progress of civilization. There were present at the congress more than 650 members.

of the faculties of the leading colleges and universities and more than 350 scientific and commercial bodies were represented. On Dec. 28, 1915, a notable address was delivered by Elihu Root. In this he urged the protection of the weak nations against the strong by the adoption of international rules of right conduct. For the first weeks of its session the dominant topics discussed by the congress related to political association and cooperation.

On January 6th President Wilson addressed the congress, dwelling in particular upon the relations of the United States with Latin-American countries. He suggested the proposal submitted to the South and Central American representatives in the previous week by Secretary Lansing as a basis for an effective agreement between all the republics of the western hemisphere "not only for the international peace of America, but the domestic peace of America." This programme, as outlined by the President, proposed that all the American nations should unite in guaranteeing to one another absolute independence and territorial integrity; that they should agree to settle all pending boundary disputes as soon as possible by friendly process; that they should agree to handle all disputes arising among them by patient, impartial investigation and to settle them by arbitration; that they should agree that no revolutionary expedition shall be outfitted against, or supplies for revolutionists shipped to, neighboring states. On January 8th, the delegates were guests of Secretary Lansing at a banquet. The addresses delivered emphasized the growing tendency toward closer relations among the American republics. The delegates on January 6th selected Lima, Peru, for the next session of the congress. This meeting is to be held in 1921, which is the centennial of the declaration of independence by Peru.

**PAN-AMERICAN INTERNATIONAL HIGH COMMISSION.** This commission, which was appointed by the Pan-American Scientific Congress at Washington, met at Buenos Aires on April 3rd, to consider the unification of legislation on commercial affairs relating to the American republics. Dr. Victorino De La Plaza, president of the Argentine republic, presided at the opening of the meeting. The representatives of the various countries included William G. McAdoo, Secretary of the Treasury, and the Minister of Finance of Brazil, Chile, Uruguay, and Ecuador. The other American republics sent delegates. The commission considered many matters of importance, and made a number of recommendations. It adopted resolutions declaring the creation of an American merchant marine of the greatest importance. There was also a strong sentiment in favor of cooperation between the leading South American republics and the United States, and the opinion was expressed that full development of such relations was impossible without an adequate American merchant marine. The conference adopted the franc, of the value of one-fifth of the United States gold dollar, as a unit of money for Pan-America. The conference urged the rapid completion of an inter-continental railway system, and the improvement of telegraphic and cable facilities in order to bring the American republics into closer union. It was recommended that governments control all wireless communications. The conference agreed, with one ex-

ception, to all the reservations made by various countries in The Hague Convention in 1912 with relation to the adoption of a uniform law for bills of exchange. Resolutions were also adopted for making clear international conventions relating to trade marks and copyrights. The arbitration plan negotiated between business men of the United States through the efforts of the Chambers of Commerce of the United States and Argentina were unanimously approved. The delegates of Uruguay gave notice of the intention of that country to sign an agreement of this nature. The revision of laws relating to commercial travelers and samples in order to unify these and reduce the taxation levied upon travelers was unanimously approved, as were also tariff statistics based on uniform classification. The commission recommended the simplification of port charges and consular fees and the reduction of postal rates.

On April 15th a permanent organization of the International High Commission was perfected. Secretary McAdoo was elected president, John Bassett More, vice-president, and Dr. L. S. Rowe, of the University of Pennsylvania, secretary-general. Headquarters are to be established in Washington. The functions of the commission are chiefly to effect uniformity of laws in the Pan-American nations. The commission is composed of nine members, including the Secretary of the Treasury and the finance ministers of the other American republics.

**PAPER.** In one form or another the effects of the war were seriously felt in the paper industry in 1916. Diminished production of paper and paper materials was experienced in the belligerent countries, which in many cases, to a considerable extent, were cut off from the normal supplies of raw materials as well as the finished product. The production of Europe, it was estimated, was cut to at least 60 per cent of normal. In the United States there was a period of prosperity and considerable profit for paper makers such as had not been experienced for several years, but as this was marked by a shortage in product in the face of a heavy demand and higher costs of materials there were corresponding high prices to which consumers took exception. This development, along with the general methods of distribution, led to an investigation of the newsprint paper situation by the Federal Trade Commission, which was still in progress at the end of the year. It may be said that any controversy as regards prices in the paper industry, especially where newsprint paper is involved, always becomes acute in the United States on account of the influence of the daily and weekly papers and their ability to direct public and legislative attention to any real or alleged disadvantages under which the publishers labor. In 1916, with the scarcity and high prices, it was alleged that many small publishers were practically deprived of their supplies and that the large consumers were favored. This, it was suggested by the Federal Trade Commission, was due as much to the jobbers as the manufacturers, and much attention was directed at the hearings to this side of the matter. The whole subject was investigated and discussed on many sides with the aim of securing relief for the smaller consumers in this era of high prices and scarcity. Price fixing powers were urged for the commission, and even an embargo on the export of paper and pulp was

proposed. Efforts were made to have the larger publishers share with the smaller people the material they had contracted for and whose deliveries they were in a position to enforce, but this did not appeal either to the manufacturers or to the large metropolitan journals and their supply agents. The manufacturers, while admitting the high prices and also their own prosperity in 1916, claimed that the industry had suffered previously and was hardly in a position to withstand radical action by the government. They called attention to the fact that in 1916 but one new newsprint mill had been built in the United States, though there were great developments in Canada, and threats were made that with more unfavorable conditions American newsprint mills would be dismantled and their machinery taken across the border to still further accelerate the industry there. Many American paper manufacturers frankly wanted tariff protection in the event of the termination of the war and were bitter against government interference and hostility.

At the end of the year all raw materials had continued to advance and the renewal of contracts at higher figures was generally predicted. White sulphate and soda pulp prices had increased and were expected to advance further and the price of rags was increasing with but a limited supply. The demand for paper was large and with the decreased supplies of foreign materials there was a shortage of labor as the prosperity of the country tempted men away from the outdoor labor of the woods and also both men and women from paper mills. Notwithstanding the demand the increase in the payrolls of the paper mills in 1916 was estimated at 35.6 per cent over 1915 and an increase in numbers of 20 per cent. The production of newsprint was about the same in 1916 as in 1915, but there were increased shipments and the stocks on hand at the end of the year were much less than in the beginning. At the same time the exports from the United States increased during the year.

The scarcity of paper in the United States led to many economies in the use of wrapping paper and in the collection and working over of waste paper. In many cities the price of newspapers was increased from one to two cents and it was thought at the end of the year that the tendency to raise the price might become general even for the larger cities, where in many cases it had been found necessary to cut down the size of the paper and stipulate that there could be no return copies. A development of the year that was agitated was the use of paper milk bottles in order to secure greater sanitation.

The paper industry in Canada in 1916 was of great importance in the commerce of that country. In 1892 the exports of paper amounted to just \$91, growing to \$24,000 in 1902, and to \$6,327,000 in 1913. In the fiscal year ended July, 1916, the exports of paper were valued at \$21,678,086, and the total exports of paper, pulp, and pulp wood at \$40,865,266. Of the exports of paper in 1916 88 per cent was taken by the United States and 5.2 per cent went to the United Kingdom. Of the total exports of paper, pulp, and pulp wood, 87 per cent went to the United States and only about 5 per cent to the United Kingdom. Canada imported \$6,327,298 of paper and paper manufactures. At the end of the year there was a controversy in Canada be-

tween the government and the manufacturers and an attempt was being made to establish a price fixing scheme.

In the fiscal year 1916 it was estimated that Canada consumed pulp wood valued at \$9,500,000, which naturally was a vast drain on the forests, and not only were new lands being exploited, but a general policy of conservation was being demanded as necessary to the future of the Dominion. In new forests Alberta was considered a promising field and new companies were being organized to work this region.

In Great Britain the Board of Trade had restricted the imports of paper and during the year the Royal Commission on Paper was instructed to cut down the importation of paper making materials as well as the manufactured article; one-half the amount of the 1914 supplies being set as the permissible figure. Naturally high prices ruled in Great Britain and supplies for its paper mills were hard to get. Paper makers urged that the amount of food coming into the Kingdom would not be diminished by permitting the imports of paper making materials, for the greater part of them came from neutral countries.

The paper situation elsewhere in Europe was, to say the least, complicated. Germany was buying up all the possible pulp in Scandinavia, but still its supplies were short. Norway had placed an embargo on shipments of sulphur and pyrites to Sweden, with the result that the industry in the latter country was somewhat embarrassed and several mills were forced to close. Sweden had laid an embargo on shipments to England. Russia had a paper shortage and the production and imports from Sweden had fallen off so that Norway was exporting to Russia and Siberia. See CHEMISTRY, INDUSTRIAL.

**PAPINI, GIOVANNI.** See ITALIAN LITERATURE.

**PAPUA, TERRITORY OF.** Prior to Sept. 1, 1906, BRITISH NEW GUINEA. A dependency of the Commonwealth of Australia, by which it has been administered since 1901. The capital is Port Moresby. The Territory of Papua consists of the southeastern part of the great island of New Guinea, together with numerous small islands lying mostly to the southeast (including the D'Entrecasteaux and Louisiade groups). The total estimated area is 90,540 square miles, of which the islands comprise 2754 square miles. The native population has been variously estimated at from 250,000 to 400,000. Whites in 1914 numbered 1186. The soil is fertile, and in 1914 plantations aggregated 42,291 acres, of which 29,030 acres were under cocoanuts, 6606 under rubber, and 3110 under sisal. Indigenous sago grows on hundreds of square miles, and an estimated 350,000 acres are under native-owned cocoanuts. As far as the British administration has been effectively extended, the natives are obliged to plant cocoanuts for food supply. The forests contain valuable timbers, much of which is accessible by river. Gold mining is an important industry on the mainland, in the Louisiade Islands, and in Woodlark Island; copper mining showed rapid development from 1910 till 1915, but in the latter year copper ore exports declined sharply. Indications of petroleum occur over large areas. In the year 1913-14, imports and exports were valued at £212,134 and £123,140 respectively; in 1914-15, £202,055 and £84,712. Exports of copper ore in the

two years, £19,733 and £5606. Gold output in 1913-14, £41,422; in 1914-15, £50,839. The trade is chiefly with Queensland and New South Wales. The local revenue and the expenditures in 1913-14 were £54,703 and £81,095; in 1914-15, £51,906 and £82,535.

**PARAGUAY.** An inland South American republic, bounded by Bolivia, Argentina, and Brazil. The capital is Asunción, a port on the Paraguay River.

**AREA, POPULATION, ETC.** That part of the country known as Paraguay proper, lying between the Paraguay and Upper Paraná rivers, has an estimated area of 253,100 square kilometers (about 97,700 square miles); a nearly equal area, between the Paraguay and Pilcomayo rivers, is claimed by both Paraguay and Bolivia, but is usually regarded as Paraguayan. This disputed region, the Chaco, is sparsely populated; its inhabitants are chiefly Indians, supposed to number some 50,000. The population of Paraguay proper has been estimated at 800,000; the people are largely a mixture of Spanish, Guarani, and negro blood, but there are many persons of pure, or nearly pure, Guarani blood. The population of Asunción, which has been estimated at 84,000, was said in 1916 to be "rapidly approaching 100,000." The population of Villa Rica is estimated at 30,000; Concepción, 25,000; Carapeguá and Luque, each 15,000; Encarnación, 12,500. During the decade 1906-14 registered births numbered 161,852 (83,873 males, 77,979 females), and deaths 70,178 (33,667 males, 35,511 females). Immigration, though encouraged by the government, is small.

Elementary instruction is free and nominally compulsory. The number of elementary schools reported for 1916 is 1046, with 1558 teachers and an enrollment of about 80,000 pupils. There are three national colleges (secondary schools), the principal one at Asunción and two small ones at Villa Rica and Villa del Pilar. The government maintains about 50 students in Europe and the United States. The state church is the Roman Catholic, but the public exercise of other religious forms is permitted. Civil marriage is obligatory.

**PRODUCTION, COMMERCE, ETC.** The soil and climate of Paraguay are favorable for the cultivation of many tropical and sub-tropical products, but agriculture is not yet highly developed. The principal crops are yerba maté, corn, beans, alfalfa, manioc, and various fruits, especially oranges. Cotton, sugar cane, sweet potatoes, rice, etc., are also cultivated. Cattle raising is important. The number of cattle in 1915 is reported at 5,249,043; horses, 478,000; mules, 17,000; asses, 18,000; sheep, 600,000; goats, 87,000; swine, 61,000; total number of head, 6,510,043, as compared with 3,002,428 in 1902. The exports of cattle from 1910 to 1915 inclusive are reported at 199,151 head. There is little manufacturing or mining. Large deposits of kaolin were reported in 1916.

Import and export values have been reported as follows, in thousands of dollars:

	1911	1912	1913	1914	1915
Imports .....	6494	5190	7876	4995	2384
Exports .....	4594	4109	5462	4447	5448

Imports of textiles (chiefly cotton goods) were valued at 986 and 770 thousand dollars in

1914 and 1915 respectively; foodstuffs, 1316 and 640; hardware, 1127 and 311; drugs and chemicals, 228 and 114. The principal exports are quebracho extract, cattle hides, yerba maté, tobacco, woods, oranges, cattle, and beef products. Trade by principal countries, in thousands of dollars:

	Imports		Exports	
	1914	1915	1914	1915
United Kingdom .....	1,138	771	112	191
Argentina .....	902	765	2,685	3,528
United States .....	416	210	11	294
Italy .....	346	170	82	87
Germany .....	1,356	162	786	4
Uruguay .....	87	30	573	557
Netherlands .....	10	18	107	586
Total, including others ..	4,995	2,834	4,447	5,448

A railway is in operation from Asunción southeast through Villa Rica to Encarnación, on the Upper Paraná (376 kilometers, or 234 miles). From Encarnación trains are ferried to the town of Posadas, an Argentine railway terminus. Telegraph line, over 2000 miles, with 64 offices. Radiotelegraph stations are installed at Asunción, Concepción, and Encarnación. Post offices, 385.

**FINANCE.** The peso as a money of account is equivalent to 96.47 cents. The actual peso in circulation is paper, of fluctuating and greatly depreciated value. During the great war it has been current at only about 2½ cents. Estimated revenue for 1916, 2,223,927 pesos gold and 38,463,600 pesos paper; estimated expenditure, 2,130,907 pesos gold and 42,767,160 pesos paper. The estimated gold receipts were: from imports, 801,000 pesos; from exports, 910,800; from other sources, 512,127 pesos. The reported outstanding foreign debt on Dec. 31, 1915, was \$1,153,503 and 68,227 pesos gold. The acknowledged internal debt at the end of 1914 was \$401,649 (exclusive of paper currency).

**GOVERNMENT.** The executive power is vested in a president, who, with a vice-president, is elected for four years by indirect vote. The legislative power is exercised by a congress of two chambers, the Senate and the Chamber of Deputies. Senators (13 in number) are elected for six years by direct vote; deputies (26) for four years. On Aug. 15, 1916, Manuel Franco was inaugurated president, in succession to Eduardo Schaerer. The new vice-president is José P. Montefo, succeeding Pedro Bobadilla.

It was reported in October, 1916, that the Paraguayan Railway had suspended operations because of serious strike disorders. Strikers and their sympathizers attacked a number of trains and burned several bridges.

**PARALLAX.** See ASTRONOMY.

**PARALYSIS, INFANTILE SPINAL.** See POLIOMYELITIS.

**PARATYPHOID FEVER.** Antityphoid vaccination has almost entirely stamped out typhoid in the army, but another, though less fatal, type of enteric fever broke out among the troops on duty in Texas along the Mexican border. This is paratyphoid fever, which attacked over 130 men of the Fourteenth Regiment and 14 among the Seventy-first Regiment of New York City, besides many others. Examination by the State Department of Health detected 40 carriers, many of whom had no history of illness. Paratyphoid fever is due to two varieties of bacilli (designated A and B), which are

similar in appearance and have similar characteristics to those of typhoid fever. The attacks last a week or more, and no specific treatment is known. Vaccination is practiced as a prophylactic. One observer has seen 40 cases of pyelitis, a serious complication. See TYPHOID FEVER.

**PARCEL POST.** See UNITED STATES, Post Office.

**PARETO, VILFREDO.** See ITALIAN LITERATURE.

**PARK COLLEGE.** A co-educational institution at Parkville, Mo., founded in 1875. It is under the auspices of the Presbyterian Church. The number of students in 1916 was 436 and the number of faculty members 23. The college has productive funds amounting to \$400,000 and in 1916 drew an income from all sources of \$117,063. The library contains 27,000 volumes. President, F. W. Hawley.

**PARKER, SIR GILBERT.** See LITERATURE, ENGLISH AND AMERICAN, Fiction, English.

**PARKS, NATIONAL.** Up to 1916 the administration of the national parks had not been delegated to any special service. The work was done by a small force in the office of the Secretary of the Interior. As the laws creating the various parks developed more or less they were administered as individual areas with no particular relation to each other. This method had been both inefficient and unsatisfactory. On Aug. 25, 1916, a law passed by Congress went into effect establishing a national park service. This law provided for the appointment by the Secretary of the Interior of a director, assistant director, chief clerk, and other employees of the National Park Service and put under the direction, subject to the supervision of the Secretary, the supervision, management, and control of the national parks and monuments and of the Hot Springs Reservation in Arkansas, which had been hitherto administered by the Department of the Interior. The act provided also that the Secretary of the Interior might make rules and regulations for the use and management of the reservations and prescribe punishment for the infraction of such rules and regulations. It also gave him the privilege to grant leases and permits for the use of the lands for the accommodation of visitors, in the reservations, for periods not to exceed 20 years, and for areas not to exceed 20 acres in any one place.

Since Congress inaugurated the policy of setting aside tracts of land in various sections of the country as pleasure grounds for the people, 16 parks have been created, the latest being the Hawaiian National Park in the Territory of Hawaii, and the Lassen Volcanic National Park in northern California. The total land comprised in these reservations is 4,821,302 acres. The following table gives the names of the national parks, the date of their establishment, and their acreage:

AREA OF NATIONAL PARKS

Park	Date of establishment	Acreage
Hot Springs Reservation, in Arkansas .....	Apr. 20, 1832	911.68
Yellowstone, in Wyoming, Montana, and Idaho ..	Mar. 1, 1872	2,142,720
Casa Grande Ruin, in Arizona .....	Mar. 2, 1889	480
Sequoia, in California ...	Sept. 25, 1890	161,597
Yosemite, in California ..	Oct. 1, 1890	719,622

Park	Date of establishment	Acres
General Grant, in California	Oct. 1, 1890	2,536
Mount Rainier, in Washington	Mar. 2, 1899	207,860
Crater Lake, in Oregon	May 22, 1902	159,860
Wind Cave, in South Dakota	Jan. 9, 1903	10,522
Platt, in Oklahoma	July 1, 1902 } Apr. 21, 1904 }	848.22
Sullys Hills, in North Dakota	Apr. 27, 1904	780
Mesa Verde, in Colorado	June 29, 1906 } June 30, 1913 }	48,966.40
Glacier, in Montana	May 11, 1910	981,681
Rocky Mountain, in Colorado	Jan. 26, 1915	229,062
Hawaii, in Territory of Hawaii	Aug. 1, 1916	75,295
Lassen Volcanic, in California	Aug. 9, 1916	79,561.58
Total		4,821,302.83

During the season of 1916 the number of tourists visiting in these parks aggregated 358,006, compared with 335,299 in 1915. Propagation of wild animal life is one of the most important functions of the national parks. Eventually they will become great nature schools to which students of animal life will resort for investigation and study. Wild animals in the Yellowstone Park have increased to such an extent owing to the protection afforded them as to warrant the Department in distributing them for propagation purposes to various parts of the country. A large number of elk, buffaloes, bears, mountain lions, and wolves were thus distributed in 1916. It is the desire of the authorities of the government to make the Grand Canyon of the Colorado, which is now a national monument, into a national park, in order to bring about the development of the reservations through the construction of roads, trails, and other improvements. The bill was introduced into the 64th Congress with the establishment of the Mount McKinley National Park in the Territory of Alaska. As noted above, Congress passed bills forming the Lassen Volcanic National Park in California, and the Hawaiian National Park in the Territory of Hawaii. The first has an area of 79,561 acres, and comprises the only region in continental United States which has shown recent volcanic action. In addition to this volcano it contains hot springs, mud geysers, ice caves, and lakes of volcanic glass, as well as many streams. The Hawaiian National Park has an area of 79,295 acres, and includes two famous active volcanoes.

**PASTEUR, LOUIS.** See RABIES.

**PATENTS.** See UNITED STATES.

**PATTERSON, THOMAS MACDONALD.** An American political leader, journalist, and lawyer, died in Denver, Colo., July 23, 1916. He was born in County Carlow, Ireland, in 1839, but came to the United States at 13 with his parents, who settled at Crawfordsville, Ind. After studying at Ashbury Academy (later De Pauw University), and being admitted to the bar, he volunteered for service in the Civil War. By 1872 he had settled in Denver, and thereafter he was identified with politics there, as city attorney, territorial delegate to Congress in 1875-77, Representative in the same body when Colorado was admitted as a State, member of the Democratic National Committee, and delegate to many national conventions of that party, United States Senator (1901-07), and a twice unsuccessful candidate for the

governorship. For a time he was alienated from his party, bolting on the nomination of Grover Cleveland for reelection, but returning in 1901. The *Rocky Mountain News*, which he had founded in 1890, and edited thereafter, he used to further political interests, and he made it a powerful weapon on behalf of the Populists during the years that he was identified with them—in 1900 he served as permanent chairman of the Populist National Convention. For many years he was considered the Democratic leader in Colorado.

**PAVEMENTS.** See ROADS AND PAVEMENTS.

**PAVLOV, IVAN PETROVITCH.** A Russian physiologist, died at Petrograd Feb. 11, 1916. Born in Rjasan in 1849, he graduated M.D. at Petrograd in 1883, and then worked in Germany under Heidenhain and Ludwig, the government having sent him abroad for two years' study in experimental medicine. In 1890 he was appointed professor of pharmacology at Tomsk. In the same year he went to Petrograd as professor at the Military Medical Academy. Remaining in the Russian capital he became director (1891) of the Institute for Experimental Medicine of the Russian Academy of Sciences, and in 1895 added to his other duties those of professor of physiology. Pavlov came to be recognized as the founder of a new school of Russian physiologists. He devoted himself to the study of the heart, glands, and digestive apparatus, and in 1904 received the Nobel prize in medicine for a work which was translated into English as *The Work of the Digestive Glands: Lectures*.

**PEABODY MUSEUM.** The Museum did not send its regular expedition to Central America during 1915-16. In the latter part of June, S. J. Guernsey, Assistant Curator of Archaeology and Ethnology, left for northeastern Arizona to take charge of the Museum's field work in that vicinity. Oric Bates, Curator of African Archaeology and Ethnology, was unable to continue excavations begun in 1913 at Marsa Matruh, between Alexandria and the Tripolitan border. He therefore proceeded to Gammal, in the Second Cataract district, where he excavated a site to which his attention had been called by Dr. Reisner. The results of this exploration will shortly appear in the Harvard African Series. The material found at Gammal is now at Cairo awaiting an opportunity for safe shipment. Mr. Bates obtained also four large flint knives of the finest Predynastic workmanship, ethnological material from the Abyssinian-Sudanese border—a collection of Bisharin baskets and steatite bowls, and one of Egyptian and Sudanese amulets.

By exchange with the Museum of Santa Cruz, Canary Islands, the Peabody Museum has obtained prehistoric material which well illustrates the character of the ancient Guanche culture as found on the Island of Teneriffe. During the year the department was engaged in preparing for publication the first number of the Harvard African Studies. Mr. John Koren, in charge of the Koren Arctic Expedition to Northern Siberia for the collection of zoölogical specimens, has forwarded the first lot of ethnological objects obtained from the Chukche of the Kolyma region. Two models have been added to the series illustrating the dwellings and home life of American tribes. One of these shows both the exterior and interior of the semi-subterranean dwelling of the Aleut of Unalaska

Island, and the other represents different types of habitations of the Eskimo of Norton Sound and the lower Yukon.

There has been received from Mr. John B. Stetson, Jr., a bronze bust of the late Prof. F. W. Putnam, by S. Eulalia, Paris, 1912, which has been placed in the eastern entrance hall of the Museum. Mr. Joseph Lindon Smith, the noted Boston artist, has presented four large paintings of monuments forming a part of the ruined city of Quirigua. These pictures were painted by Mr. Smith during his recent visit to Guatemala. Director of the Museum, C. C. Willoughby.

**PEACE MOVEMENT.** See INTERNATIONAL PEACE AND ARBITRATION.

**PEARSE, (PADRAIC) PATRICK.** An Irish revolutionist, executed for high treason in the Tower of London, May 3, 1916. He was born in Dublin in 1881, studied law, was admitted to the bar, but identified himself with the Gaelic League movement which was organized to study and revive the Irish language and traditions. He edited the League's journal, *The Morn of Light*, and later resigned to become headmaster of St. Edna's Secondary School for Boys at Rathfarnham, a Dublin suburb. Here he sought to train his pupils in the earnest study of Irish history and tradition. When the Irish volunteer movement began in opposition to the arming of Ulster, Pearse heartily supported it, but later became more radical and revolutionary, sympathizing with the extreme Sinn Fein party. He plotted with them in their preparations for an outbreak, accepted the position of provisional president of the Irish republic, and on April 24, 1916, the first day of the revolt, signed the proclamation in which the founding of the republic was announced and the order for unconditional surrender seven days afterward. Upon his surrender, with his fellow revolutionists, he was taken across the channel, tried by court martial, and shot in the Tower of London. Pearse was a man of culture, a poet, and an eloquent speaker and writer, but an idealist without much practical knowledge of affairs.

**PEAT.** See FERTILIZERS.

**PÊCHEURS DES PERLES, Les.** See MUSIC, Opera.

**PECK, GEORGE WILBUR.** An American governor, journalist, and author, died April 16, 1916, at Milwaukee, Wis. He was born in 1840 at Henderson, N. Y., but three years later his family moved to Wisconsin, where he was educated in the public schools and learned the trade of printer. At the opening of the Civil War he owned a half interest in the *Jefferson County Republican*. He enlisted and was promoted lieutenant. Afterward he was owner, successively, of the *Ripon Representative*, the *LaCrosse Democrat*, and the *LaCrosse Sun*, which he removed to Milwaukee and renamed *Peck's Sun*. Mr. Peck became noted for humorous sketches, especially for a series known as "Peck's Bad Boy," volumes of which appeared from 1882 till 1907. After serving as mayor of Milwaukee in 1890-91, he was elected Governor of the State, which office he held till 1895. There had been but two Democratic Governors of Wisconsin before him.

**PEEL, WILLIAM GEORGE.** An Anglican prelate, died April 15, 1916, in Mombasa. He was born in India in 1854 and was educated at the Church Missionary Society Theological School in London. After his ordination in 1879 he

went to India, where he was a master and then principal of the Church Missionary Society College at Masulipatam. From 1889 to 1899, when he became Bishop of Mombasa, British East Africa, he served as a secretary of the Church Missionary Society in India. Bishop Peel figured in the Kikuyu heresy case that caused a stir in 1914. The Bishop of Zanzibar charged that he and the Bishop of Uganda had been responsible for administering the communion to nonconformists at a missionary conference held in 1903. Questions, especially of discipline and church policy, came up for consideration before 14 Anglican bishops, presided over by the Archbishop of Canterbury. The charges were dismissed: but clergy were advised that the rules of the Church did not provide for such services as that at Kikuyu.

**PELLAGRA.** The pellagra situation in several of the Southern States still continues to be a serious problem for the sanitarian, and opinion is still divided as to the exact causation of the disease. Goldberger's theory, that it is a question of food, has support in the results he obtained in several institutions and in a convict camp. His summary follows: Diet is the common factor in the various treatments advocated, and to its success is largely due. Marked increase in the fresh animal and vegetable protein elements of the diet is favorable for recovery: while an abundant but one sided diet, chiefly of carbohydrates (wheat, corn, rice), free from fresh animal food and legumes, proved inviting to the development of the disease. The pellagra-producing dietary "fault" is capable of correction or prevention with animal or leguminous proteins.

Neshitt made a study on the sanitation and control of pellagra in Hanover County in North Carolina, in the rural sections of which an intensive effort at sanitation began in July, 1914. The effort was concentrated on excreta disposal and water supply in order to control intestinal infections, which were especially prevalent. By the beginning of 1915 every rural home, black and white, in the county had been supplied with a privy at the owner's expense. At that time there were about 12 privies in the rural district which were not provided with receptacles and in which there was not a more or less successful effort at fly proofing. The conditions were maintained, and, indeed, there was a marked improvement in this respect during 1915. In December, 1914, Prof. C. W. Stiles and Dr. L. L. Dumsden, of the United States Public Health Service, made a survey of the rural sections of this county with special reference to the method of excreta disposal in use. A second survey was made in December, 1915, by Prof. C. W. Stiles and Dr. George M. Cooper, director of the Bureau of Rural Sanitation of the North Carolina State Board of Health. The last survey disclosed the fact that on the system of scoring used by the United States Public Health Service, the rural sanitary index in New Hanover County has been increased in a single year by 45 per cent. The rural population has been instructed in all disease prevention methods with the exception of pellagra, the means of preventing pellagra being only recently established. The incidence of this disease in the rural section as in the city has increased during the past year. The incidence among the rural population from the cases reported shows three cases per thousand

inhabitants, while in the city the incidence is a little more than one case per thousand. Experience shows that there are a great number of mild cases of this disease which are not reported and in which the patients present themselves to physicians and hospitals for treatment. The numerical relation existing between the rural and city cases is about as stated above. The following conclusions seem to be justified: There is no existing relation between soil pollution and the incidence of pellagra. Close supervision of all cases, disinfection, fumigation, isolation, and the other usual means of controlling infection have no influence on pellagra incidence. Business depression, lack of employment, a limited market for products, and raised prices of food, with consequent increase of indigence, augment the incidence of pellagra very definitely.

Jobling and Petersen, studying the incidence of pellagra in Nashville, Tenn., from 1911 to 1916, by a pellagra commission, gathered data of more than 500 cases and studied the subject from every possible angle, including the relation of sex, age, race, season of the year, social and economic surroundings, housing, occupation, diet, milk and water supply, parasites, sewage disposal, and previous exposure. After studying the relations of these various circumstances to the occurrence of pellagra, they found no valid solution in the various theories already advanced. There were proteins in the diet and no marked excess of carbohydrates; the water supply was used by pellagrins and non-pellagrins in common; and sufficient vitamin-containing substances were present in the diet. The conclusions point toward the fact of a significant localization of this disease in certain areas of the city, which areas differ in only one respect from the non-pellagrous localities, namely, the method of sewage disposal.

Pellagra was largely confined to the unsewered areas of the city, and of those pellagrins who lived elsewhere, the majority had developed the disease while living in an unsewered neighborhood or on the edge of an unsewered area, or had been in the habit of visiting friends and relatives in an unsewered area. The sanitary conditions in the unsewered sections of the city were of the worst. In an area of a square mile in which pellagra and typhoid were most prevalent were found 1500 privies, rarely cleaned and almost never enclosed so as to prevent the entrance of flies. These privies were located seldom more than 50 feet, and frequently not more than 15 to 20 feet, from the kitchens of the houses. Two per cent of the kitchens were screened. Another significant fact brought out in the survey was that 78.8 per cent of the patients

had been in intimate contact with other pellagrins before they themselves had developed the disease. Finally, the installation of sewers in certain areas was followed by a decrease in the number of cases of pellagra originating therein, and the isolation of cases in certain institutions in which pellagra had made its appearance seemed to prevent the further spread of the disease.

**PENANG.** An island off the west coast of the Malay Peninsula. With other islands and some territory on the mainland, it constitutes a division of the Straits Settlements (q.v.).

**PENNSYLVANIA. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 8,591,029. The population in 1910 was 7,665,111.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn . . . . . 1916	1,450,000	56,550,000	\$54,854,000
1915	1,520,000	58,520,000	40,964,000
Wheat . . . . . 1916	1,875,000	26,125,000	42,322,000
1915	1,830,000	24,605,000	25,589,000
Oats . . . . . 1916	1,130,000	35,030,000	19,967,000
1915	1,140,000	43,320,000	19,061,000
Potatoes . . 1916	272,000	19,040,000	28,179,000
1915	280,000	20,160,000	15,120,000
Hay . . . . . 1916	8,255,000 <sup>a</sup>	5,208,000	71,870,000
1915	3,100,000	4,340,000	67,704,000
Tobacco . . 1916	86,100 <sup>b</sup>	49,096,000	6,972,000
1915	31,100	42,390,000	3,900,000
Rye . . . . . 1916	260,000	4,420,000	4,818,000
1915	274,000	4,932,000	4,148,000
Barley . . . . 1916	12,000	300,000	225,000
1915	8,000	236,000	177,000

<sup>a</sup> Tons. <sup>b</sup> Pounds.

**MANUFACTURES.** The census for manufactures for 1914 shows a consistent increase as compared with that for 1909 with the exception of the number of establishments, proprietors, and firm members, which show a decrease, but these decreases show no indication of a light decrease in the manufacturing activities of the State. The capital invested in manufacturing industries in 1914 was \$3,149,411,000, a gain of \$400,405,000 or over 14.6 per cent over 1909. The value of the products was \$2,832,349,000 in 1914, compared with \$2,126,742,000 in 1909, an increase of nearly 8 per cent. The salaries and wages paid in 1914 amounted to \$672,563,000, compared with \$566,524,000. The average number of wage earners in 1914 was 824,478, compared with 877,543 in 1909. The most important facts relating to manufacturing industries in 1914 in comparison with 1909 are shown in the following table:

	Census—		Per cent of increase, 1909-1914
	1914	1909	
Number of establishments . . . . .	27,521	27,568	-0.2
Persons engaged in manufactures . . . . .	1,060,562	1,002,171	5.8
Proprietors and firm members . . . . .	28,084	29,743	-5.7
Salaried employees . . . . .	108,050	94,885	13.9
Wage earners (average number employed during the year) . . . . .	924,478	877,543	5.3
Wage earners, by months:			
January . . . . .	945,481	819,927	.....
February . . . . .	949,917	825,082	.....
March . . . . .	962,114	835,617	.....
April . . . . .	955,614	844,230	.....
May . . . . .	942,197	850,373	.....
June . . . . .	936,124	867,526	.....
July . . . . .	920,404	860,425	.....
August . . . . .	914,502	878,808	.....



	Census—		Per cent of in- crease, 1909- 1914 1
	1914	1909	
September .....	917,925	911,802	.....
October .....	902,734	983,852	.....
November .....	873,138	947,698	.....
December .....	873,586	960,666	.....
Primary horse power .....	8,549,858	2,921,547	21.5
Capital .....	\$3,149,411,000	\$2,749,008,000	14.06
Services .....	672,563,000	566,524,000	18.7
Salaries .....	144,610,000	110,897,000	30.4
Wages .....	527,953,000	455,627,000	15.9
Materials .....	1,688,921,000	1,582,560,000	6.7
Value of products .....	2,832,349,000	2,626,742,000	7.8
Value added by manufacture (value of products less cost of materials) ..	1,143,428,000	1,044,182,000	9.5

1 A minus sign (-) denotes decrease.

**MINERAL PRODUCTION.** The estimated production of bituminous coal of the State in 1916 was 175,000,000 net tons, an increase compared with 1915 of 17,000,000 tons, or nearly 11 per cent. The largest factor in this increase was the activity of the iron and steel business, which resulted in the tremendous demand for coke. Coke made from both beehive and by-product was 10,000,000 tons more in 1916 than in the previous year. Railroad and general industrial demands broke all records for coal. Car shortage, insufficient labor supply, labor disturbances, and a lowering of the efficiency of the labor all restricted the production to such an extent that at times the mines of the State were not able to supply even the most urgent demands of their normal markets. Coal from Ohio, Indiana, and Illinois was shipped into Pennsylvania. A lack of transportation from mine to market was the most potent check on output. In the last quarter of 1915 and the first months of 1916 there was a marked shortage of cars. A temporary lull in demand in April relieved conditions somewhat and from May to August the supply of cars was more nearly normal. From September to the end of the year as the demand for coal increased the car shortage continued to become worse. Scarcity of labor was most apparent during the summer when cars were more readily to be had, but there was in reality no improvement in the supply of men as the year progressed. Central Pennsylvania was more seriously affected by the scarcity of labor and the labor troubles than the other bituminous fields of the State.

The production of petroleum in the State in 1915 was considerably less than in 1914. There were produced 7,838,705 barrels, compared with 8,170,335 barrels in 1914.

The iron ore mined in the State in 1915 amounted to 363,309 tons, compared with 406,326 tons in 1914. The value of the ore shipped from the mines in 1915 was \$333,697, compared with a value in 1914 of \$399,639.

**TRANSPORTATION.** The total number of miles operated in the State in 1915 was 12,954. There were constructed during the year 383 miles of new track. The railroad having the longest mileage is the Pennsylvania, 4527. The Delaware, Lackawanna, and Western operated 958 miles, the Delaware and Hudson 885, the Central of New Jersey 680, the Erie 1987, New York Central 919.

**EDUCATION.** The total enrollment in the public schools in 1916 was 1,504,794. The average daily attendance was 1,212,157. There were employed 42,727 teachers, of whom 9163 were male and 33,564 female. The average monthly

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salary of male teachers was \$68.60 and of female teachers \$50.55.

**FINANCE.** There was a balance in the treasury on Dec. 1, 1916, of \$4,617,202. The receipts for the fiscal year amounted to \$36,663,039, and the disbursements to \$35,489,553, leaving a balance in the treasury at the end of the fiscal year of \$5,790,687. The principal sources of revenue are corporation taxes, automobile license fees, and collateral inheritance tax. The principal expenditures are for public schools, construction of highways, and the support of hospitals and other State institutions. The public debt of the State was \$651,110.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions of the State include the Pennsylvania State Lunatic Asylum at Harrisburg, the State Hospital for the Insane at Danville, State Hospital for the Insane at Warren, State Hospital of the northeastern district of Pennsylvania at Norristown, State Asylum for the Chronic Insane at Wernersville, Homeopathic State Hospital for the Insane at Allentown, State Hospital for the Criminal Insane at Fairview, State Institution for the Feeble-Minded of Western Pennsylvania at Polk, State Institution for the Feeble-Minded in Eastern Pennsylvania at Pennherst, Pennsylvania Village for Feeble-Minded at Glen Iron, State Hospital for Injured Persons at Fountain Springs. Hospitals are also maintained in all the mining regions of the State. The Pennsylvania Soldiers' and Sailors' Home at Erie is also under the supervision of the board of public charities. The penal institutions include the Western Penitentiary at Pittsburgh and Bellefonte, Eastern Penitentiary at Philadelphia, the Pennsylvania Training School at Morgantown, the Pennsylvania Industrial Reformatory at Huntingdon, State Industrial Training Home for Women at Muncie Station. In addition to these there are many State institutions which are under the semi-control of the Board of Public Charities.

A special committee of the bar association of the State which was appointed in 1916 to consider the revision of the State penal laws reported in July in favor of the abolition of the county jails as places of confinement for convicted prisoners. The committee recommended the establishment of six industrial farms in different parts of the State, where prisoners in the county jails can be provided for employment and compensation, on the same principle put in force in the prisons and reformatories under the prison labor commission, which was created by the Legislature of 1915.

**POLITICS AND GOVERNMENT.** The Legislature did not meet in 1916. The principal govern-

mental changes were the putting into practice of the workmen's compensation and the child labor laws, both enacted at the 1915 session. It was a favorable time for the introduction of innovations, since the extraordinary activity of most business and industries, coupled with the labor shortage and the upward trend of wages and prices of commodities and manufactured products, enabled adjustment to the changes and absorption of the added costs without difficulty; at a more normal time a problem might have been presented.

The national election had the curious effect of bringing back to the Republican fold nearly all of the Progressives who had not returned in 1914, and at the same time opening one of the bitterest factional fights for party control in the State that has waged for many years; the Democrats were firmly united and attracted many independent voters, so that President Wilson polled the largest vote ever given to a Democratic presidential candidate. The party enrollments of voters for the primary election of May 16th showed the Progressive party all but extinct; nevertheless those remaining true to the schism of 1912 elected a full delegation to the Progressive convention in Chicago. The Republican primary campaign was enlivened by a combination of Gov. Martin G. Brumbaugh with the Vares of Philadelphia to gain control of the delegation to Chicago in the interest of Theodore Roosevelt, the Governor announcing his own candidacy for the presidency with the intention of delivering the Pennsylvania delegates to Roosevelt. In the bitterness of the contest it was revealed that Governor Brumbaugh, when a candidate for the governorship in 1914, had accepted large sums of money for which he did not account in making return of his campaign expenses as required by law; one contribution of \$1000 by Mr. David B. Oliver of Pittsburgh was described by Governor Brumbaugh as a donation for his personal expenses, though his telegram and letter of acknowledgment proved he received the money as a campaign contribution. On his side of the contest, the Governor resorted to every means at his command to compel support of his faction, dismissing State Insurance Commissioner Charles Johnson for not electioneering for him. The regular Republican organization, under the leadership of Senator Boies Penrose, elected a majority of the delegates to the national convention. Former Secretary of State Philander Chase Knox was the organization's choice for the presidency, but his name was not formally presented to the convention. Governor Brumbaugh's was. On the first roll call the delegation was polled as follows: For Knox 36, Brumbaugh 29, Hughes 2, Roosevelt 8, absent 1. Governor Brumbaugh then withdrew, declaring himself for Roosevelt. The second roll call resulted: For Knox 36, Hughes 8, Roosevelt 23, Wanamaker 5, Dupont 2, Root 1, absent 1. On the final ballot the Pennsylvania delegation stood: For Hughes 72, Roosevelt 3, absent 1. Senator Penrose was elected Pennsylvania member of the national committee.

The Governor and the Vares had set up candidates in the primaries for the two State offices to be filled, State treasurer and auditor-general, but they were defeated.

The election campaign was tame, being characterized only by the unusual optimism of the

Democrats and real contests in a few congressional districts. Election returns showed:

For President—Hughes (Rep.), 703,734; Wilson (Dem.), 521,784; Benson (Soc.), 42,737; Hanly (Pro.), 28,525. For United States Senator to succeed George T. Oliver who declined to be a candidate—P. C. Knox (Rep., Keystone, Personal Liberty, Roosevelt Progressive), 680,451; Ellis L. Orvis (Dem.), 450,106; Charles W. Ervin (Soc.), 45,385; Herman T. Ames (Pro.), 30,089; scattering, 2409. For Congressman-at-Large—Thomas S. Crage, Mahlon M. Garland, Joseph McLaughlin, and John R. K. Scott (Reps.) were elected. For State Treasurer—H. M. Kephart (Rep., Bull Moose, Keystone, Personal Liberty), 667,144; James Cramer (Dem.), 463,503; Charles Sehl (Soc.), 44,963; E. J. Fithian (Pro.), 31,552; scattering, 2179. For Auditor-General—Charles A. Snyder (Rep., Keystone, Bull Moose, Personal Liberty), 682,940; James B. Murrin (Dem.), 448,856; Walter C. Tyler (Soc.), 47,258; William Repp (Pro.), 33,298; scattering, 2106. For Judge of the State Supreme Court (Non-partisan)—Emory A. Walling, 569,046; Charles Palmer, 250,933; scattering, 77. (Over a quarter of a million electors who voted for auditor-general did not vote for supreme court judge.)

Of the 32 congressmen elected in districts, 25 are Republicans and 7 Democrats. Notable victories were scored by the Democrats in the thirtieth and thirty-second districts, both in Allegheny County. In the former M. Clyde Kelly, who was beaten for the Republican nomination and was afterward placed on the Democratic ticket, defeated William H. Coleman, and in the latter Guy E. Campbell, a Democrat, was elected over A. J. Barchfeld. Coleman and Barchfeld are sitting Republican congressmen. Organized labor's dissatisfaction with the representatives' opposition to the Adamson bill and local option sentiment contributed most to the overturn in these normally strong protective tariff districts.

Immediately after the election a factional contest began for control of the legislative organization. Governor Brumbaugh and the Vares united again and the Governor employed his power to compel State department executives and employees to secure support for his candidate for speaker of the House of Representatives. He dismissed A. Nevin Pomeroy, State printer, from office and threatened others with a similar fate. He made no effort during the campaign nor after the election to advance the cause of local option, to do which he pledged himself in 1914 and which promise gained him much support in a bitter contest for the governorship.

The United States grand jury at Pittsburgh investigated the use of money by corporations in the Federal election of 1914 and returned 101 indictments against 72 brewing corporations and associations within and without the State for alleged violation of the United States Corrupt Practices Act. The defendants having moved to quash the indictments on the ground that the law was unconstitutional, Judge W. H. S. Thomson gave decision against their contention on December 23rd.

STATE OFFICERS. Governor, Martin G. Brumbaugh; Lieutenant-Governor, Frank B. McClain; Secretary of State, Cyrus E. Woods; Treasurer, Robert K. Young; Auditor, A. W. Powell; Adju-

tant-General, Thomas J. Stewart; Attorney-General, Francis S. Brown; Superintendent of Education, N. C. Schaeffer; Commissioner of Insurance, J. Denny O'Neill; Secretary of Agriculture, Charles E. Patton—all Republicans except Nathan C. Schaeffer, Democrat.

**JUDICIARY.** Supreme Court: Chief Justice, J. Hay Brown; Associate Justices, S. Leslie Mestrezat, William P. Potter, John Stewart, Robert von Moschziaker, Robert S. Frazer, Emory A. Walling; Clerk, William Pearson.

**STATE LEGISLATURE:**

	Senate	House	Joint Ballot
Republicans .....	39	169	208
Democrats .....	10	37	47
Progressives .....	1	..	1
Socialists .....	..	1	1

**PENNSYLVANIA, UNIVERSITY OF.** A non-sectarian educational institution in Philadelphia, Pa., founded in 1740. Including the summer school, teachers' courses, etc., there were more than 9000 students in all departments in 1916. The faculty numbered approximately 700. During the year Dr. Roswell P. McCrea, dean of the Wharton School of Finance and Commerce since 1912, resigned to become professor of economics at Columbia University. Dr. J. William White, for many years professor in the university, left \$400,000 to it, of which \$150,000 was to be used to endow the J. William White professorship of surgical research. It was announced that eventually, through the receipt of a legacy, the Isaac Ott chair of physiology would be established. A new maternity building for the medical school hospital, costing \$200,000, was erected. The medical school celebrated its 150th anniversary. The productive funds of the university amount to \$3,064,406, and in 1916 it had a total income of \$1,883,056. In the library were over 400,000 catalogued volumes and 50,000 unbound pamphlets. Provost, Edgar Fahs Smith.

**PENNSYLVANIA ACADEMY.** See PAINTING AND SCULPTURE.

**PENNSYLVANIA STATE COLLEGE.** A co-educational State institution at State College, Pa., founded in 1855. In the fall of 1916 there were 3663 students and 293 faculty members. During the year important new heads of departments were appointed as follows: Prof. E. A. Fessenden (mechanical engineering); Prof. S. W. Fletcher (horticulture); Prof. S. Raamussen (dairy husbandry). There were no noteworthy benefactions during the year. The productive funds of the institution in 1916 amounted to \$517,000, and the income, with the exception of that for buildings, was \$817,324. In the library were 60,400 bound volumes and 40,000 pamphlets. President, Edwin Erle Sparks.

**PENNYPACKER, GALUSHA.** An American soldier, died at Philadelphia, Oct. 1, 1916. He was born in Chester County, Pa., in 1844, and was educated at the Phoenixville (Pa.) Classical Institute. Entering the army on April 22, 1861, on an enlistment for three months, he re-entered the service later the same year as a captain in the Ninety-seventh Pennsylvania. He was employed chiefly in the operations along the Atlantic coast until April, 1864. Afterward he was transferred to the Army of the

James and took part in the action at Drury's Bluff (May 13-16, 1864), where he was wounded. Later he commanded a brigade at the capture of Fort Harrison, where he was again wounded, but recovered in time to take part in the final assault on Fort Fisher (Jan. 15, 1865), where his third wound received in the war was so serious that he was confined to a hospital until his resignation from the service in April, 1866. In February, 1865, he was promoted to brigadier-general of volunteers, and was awarded the Congressional Medal of Honor for distinguished bravery in battle. He was brevetted major-general of the United States army in 1867. In 1883 he was placed on the retired list on account of wounds, and in 1904 was made brigadier-general of the United States army, retired.

**PENNYPACKER, SAMUEL WHITAKER.** An American jurist and governor, died at Schwenksville, Pa., Sept. 2, 1916. He was born in 1843 at Phoenixville, Pa. His education was cut short by the death of his father, who was a professor in the Philadelphia College of Medicine, but while teaching school he studied law. In 1866, after serving in the Civil War and finishing the law course at the University of Pennsylvania, he was admitted to the bar. He became early known for his work as an editor of law books, among these being the *Pennsylvania Supreme Court Reports*, known as *Pennypacker's Reports*, in four volumes. In 1889 he was elected a judge of the court of common pleas at Philadelphia, and was reelected 10 years later, having meanwhile become presiding judge. In 1903, however, he gave up his seat on the bench to become Governor, having been elected as a Republican for a four-year term. A cousin of Senator Matthew S. Quay, Governor Pennypacker showed, many believed, that his political acts were influenced by that famous "boss." At any rate, although he was responsible for putting through important legislation, he became best known because the graft scandal connected with the furnishing of the new State capitol was uncovered during his term. His friends claimed that he had no knowledge of what was going on, and at his instance reform measures were passed. Governor Pennypacker, who was deeply interested in colonial history, wrote *Pennsylvania in American History* (1910) and *Pennsylvania, the Keystone, a Short History* (1914), and for many years he was president of the Historical Society of Pennsylvania.

**PENOLOGY.** One of the most significant aspects of modern developments in reform social opinion includes the changes in the attitude of society toward law breakers and their punishment. New theories of criminology emphasize the responsibility of society for the creation of the criminal. The latter, instead of the willful and obstinate offender against the laws of society, is now viewed as a product of social and hereditary factors over which he had no or little control. While this does not remove the necessity of some form of special treatment, it does require that such treatment shall take the form, not of retributive punishment, but rather of reconstitution of the offender by means of education and training which will establish new mental habits and new norms of action. Consequently the new theories of penology lay emphasis upon the individualization of punishment,

the education of the convict in the rudiments of learning, his training in some form of industrial art, and the cultivation of the sense of individual worth and social responsibility. Not only do repeated investigations show that a large proportion, usually the majority, of prisoners are illiterate, but frequently a majority are found to be feeble-minded or insane. Consequently improved methods of prison management require not only the introduction of expert medical attention, but also the employment of an expert in psychiatry.

The tendency toward more frequent and responsible administration was shown in Massachusetts by the abolition of the former prison commission and the creation of a single salaried director of prisons, with an unpaid advisory board. Another widespread movement was illustrated in Illinois in the efforts to abolish county jails and to substitute State penal farms for jails in the treatment of misdemeanants. In Congress the Booher-Hughes bill advocated for a number of years by the National Committee on Prisons and Prison Labor for the control of Federal prisons again failed of final enactment. It has been passed by the House four times and favorably reported by a Senate committee. While its main purpose is to prevent the interstate shipment of convict-made goods it also aims to perfect prison administration by the creation of a national commissioner of prisons to have charge of all phases of the administration of Federal penitentiaries.

THE AMERICAN PRISON ASSOCIATION held its annual meeting at Buffalo in October. Representatives were present from more than 20 institutions and societies which maintained clinics for psychological tests. The psychological study of law-breakers received special emphasis in the discussion, such study being essential to the success of any method of mental or moral reconstruction. One of the most notable addresses was that by Dr. Paul M. Bowers, the medical superintendent of the Indiana State Hospital for Insane Criminals, who held that jurists should study men rather than books. He gave statistics showing that out of 100 criminals 23 per cent were feeble-minded, 10 per cent epileptic, and a large per cent insane. He indicated a direct relation between the crime committed and the mental deficiency in each case. Moreover, for 100 convicts there had been held 108 trials costing the State \$180,000, most of which could have been saved by proper mental tests. Among other topics emphasized was the need of more individualization in the treatment of criminals.

NEW YORK STATE. The year opened with matters at Sing Sing in a somewhat complicated state. Thomas Mott Osborne was under indictment by the grand jury of Westchester County, N. Y., on the charges of perjury and neglect of duty, and at his own request had been granted a leave of absence from the wardenship of Sing Sing; George W. Kirchwey accepted the position temporarily. During the first week in January Governor Whitman demanded the resignation of John B. Riley as State Superintendent of Prisons, and on Mr. Riley's refusal to resign the Governor served charges upon the superintendent and set Tuesday, January 11th, as the day for the hearing. The direct cause for the Governor's act was the order of the State superintendent which di-

rected that 66 prisoners be transferred from Sing Sing to the State prison at Dannemora. Most of these prisoners were prominent as members of the Mutual Welfare League or self-governing body, and their transfer from Sing Sing would have meant a temporary disarrangement of the new order inaugurated by Mr. Osborne. In his note to Mr. Riley, Governor Whitman implied that personal hostility to Mr. Osborne was the motive which actuated the order for the transfer of prisoners. Mr. Riley was succeeded by James M. Carter. Early in March the first of two indictments against Mr. Osborne were dismissed by Justice Thompson of the Supreme Court of Westchester County without giving the case to the jury. The trial on the charges of immorality and mismanagement was set for the last week in March and again Mr. Osborne was cleared, greatly to the satisfaction of the public, which considered that his indictment was a part of a political conspiracy. On July 16th Mr. Osborne returned to Sing Sing as warden, Mr. Kirchwey retiring to make way for him.

During his period of wardenship, Mr. Kirchwey continued the prison reforms inaugurated by Mr. Osborne. Under his administration the dietary of the prison was vastly improved by the combined efforts of Dr. Emily C. Seaman of Teachers College, Columbia University, and the prison food committee. Also a first class medical service was established. The plan for this calls for a medical director who shall devote all his time to the prison; a prison physician and assistant who also shall devote all their time to the work; a staff of visiting specialists from the hospitals and medical schools of New York City; a dentist; a neurologist; a throat and eye specialist; and any others necessary. On August 1st, the psychiatric service under the auspices of the National Committee for Mental Hygiene was put in operation. It receives an appropriation of \$10,000 a year for five years from the Rockefeller Foundation. Dr. Bernard Gleuch, formerly of the Government Hospital for the Insane in Washington, is head of the department. The work of this department will be the examination of each prisoner for mental development, and the classification of all present and incoming prisoners. Finding that fully two-thirds of the prisoners had received no adequate industrial training, Mr. Kirchwey established a school of industrial arts with courses supplementing those in mechanical drawing, telegraphy, stenography, and automobile repairing, already instituted by Mr. Osborne.

Some of the results of Mr. Osborne's work were set forth by the Westchester County Research Bureau. It was shown that the number of prisoners suffering from cuts and stabs received in prison fell from 291 in 1913 and 288 in 1914 to 71 in 1915; the increased attention to health was shown by the increase in the percentage of the average daily prison population treated in hospitals, which rose from 23½ per cent for 1911-12, to 30½ per cent for 1913-14, and to 42 per cent in 1915. The percentage of the population which went insane fell from 2.1 per cent in 1912 and 3.3 per cent in 1913, to 1.8 per cent in 1914 and 1.2 per cent in 1915. In addition to perfecting hospital care, Mr. Osborne reformed the purchasing department by receiving secret bids for supplies instead of giving "political" contracts; and by putting the accounting department on a modern basis. In-

deed, it was said that these changes were the real source of hostility to him. The gross sale of goods made in prison was increased 11 per cent and the profits 100 per cent; while the prisoners were given three meals a day instead of two. Also it was due to Mr. Osborne's agitation that the bill authorizing the building of a new prison on another site to supplant Sing Sing passed the New York Legislature. This new prison will have an entirely different style of architecture.

Mr. Osborne's connection with Sing Sing ended October 16th when his resignation became effective. He accused his superiors of unfriendliness and of interference with his management of the prison. He attacked both Superintendent of Prisons Carter and Governor Whitman. It was said that there was objection to the "practice of featuring convicts and indiscriminate prison advertising"; to the indifference toward escapes of prisoners. While Mr. Osborne objected to orders from above requiring life and long-term prisoners to be confined within the walls of the institution, he himself was accused of tactlessness, moodiness, credulity, and inability to get along with others in authority.

William H. Mayer, ex-warden of the Federal penitentiary at Atlanta, was appointed as Osborne's successor. It seemed doubtful whether under the new administration the experiment in self-government would continue.

**PROBATION.** There is no more important aspect of modern penology than the development of the probation system. This involves social investigation and the combination of social service with the administration of justice; it removes in multitudes of cases the necessity of incarceration and has already enabled thousands of persons to remain at large earning honest livings who otherwise would be in prison. Probation is now provided in some of the courts of 46 States and 2 Territories. In 1916 there were at least 1000 salaried probation officers besides numerous unsalaried ones, and it was estimated that fully 160,000 persons of all ages were on probation during the year.

Separate probation commissions have been established in New York, Massachusetts, and Vermont, with the result that great improvements have been made in the development of standards and uniformity and in the extension of the system to smaller communities. The National Probation Association meets annually, usually in conjunction with the National Conference of Charities and Corrections. In 1916 the officers were: President, Albert J. Sargent, Boston; vice-presidents, Mrs. Benjamin J. West, Memphis, Tenn., John W. Houston, Chicago, and Thomas G. Parris, Philadelphia; secretary-treasurer, Charles L. Chute, Albany, N. Y. The United States Supreme Court has declared that Federal courts have no authority to suspend sentences under existing statutes. Consequently the Owen-Hayden bill was introduced in Congress authorizing Federal courts to suspend sentence and place offenders under the supervision of probation officers. It was expected that this measure would tend to standardize the probation system and stimulate its extension to communities not yet reached by it.

**THE NEW SING SING.** At the close of the year plans were being formulated for the construction of a new State prison of the modern

type with a farm and extensive facilities for industrial training. This was to be located at Wingdale or at Beekman, and it was expected that a large part of the construction work would be done by the prisoners themselves. It was certain that the old-style cell-block type of construction would be abandoned and that a combination of dormitories and single cottages would take its place. It was planned that thereafter Sing Sing should serve as a receiving, analyzing, and distributing station. It would have a staff of experts in physical and psychological measurements and all convicts of the State would be sent there for diagnosis, physical and mental examination, with a view to separating the tubercular, insane, those having contagious diseases, and other special types. These would then be sent for treatment to special hospitals and institutions, while all convicts approximately physically and mentally normal would be sent to the new prisons. These reforms were expected to place the New York prison administration well in advance of the rest of the country.

**Bibliography.** Books and pamphlets published during the year included the following: American Prison Association, *Proceedings, 1915*; Edith Abbott, *One Hundred and One County Jails in Illinois and Why They Ought to be Abolished*; also, *Real Jail Problem*; W. A. Bonger, *Criminality and Economic Conditions*; California State Board of Charities and Corrections, *Study in County Jails in California*; F. M. Sostoevskii, *Crime and Punishment*, tr. by Constance Garnett; Enrico Ferri, *Criminal Sociology*; National Committee on Prisons, *Prisoners as Prison Reformers*; A. S. Oliphant, *Evolution of the Penal System of South Carolina from 1866 to 1916*; T. M. Osborne, *Society and Prisons*; W. H. Wadhams, *New Prison System*.

**PENSIONS.** See OLD-AGE PENSIONS; PENSIONS FOR MOTHERS; UNIVERSITIES AND COLLEGES.

**PENSIONS FOR MOTHERS.** Beginning in 1912 a movement for the enactment of pensions for widows or mothers with minor children swept over the country. This legislation was due in part to child labor laws which had steadily advanced the age at which children might be employed and thus threw various families upon public relief, and in part to a desire to keep young children with their own mothers. As indicated below, the qualifications of recipients varied widely, and much criticism has been advanced against this legislation on the ground that it has been hasty, ill-considered, and likely therefore to result in cultivating a spirit of dependency. Nevertheless, the general principle of State aid in the rearing of children of necessitous families has been overwhelmingly approved by public opinion.

**QUALIFICATIONS OF RECIPIENTS.** Divorced and deserted women were excluded from the benefits of the mothers' pension law by the Washington Legislature because it is alleged that divorce and desertion were thus encouraged. It was nevertheless admitted by social workers that three-fourths of the divorced or deserted mothers in Washington were really worthy of a pension. Moreover, in the 27 other States with mothers' pension laws, it would seem that the terms "parent" or "mother" would be so broadly construed as to include both divorced and deserted women. On the other hand a recent judgment of the Iowa Supreme Court giv-

ing a very strict interpretation, might compel the exclusion of divorced and deserted women in 12 of these 27 States. The following is a synopsis of the qualifications which the various laws require of recipients of pensions: California, widow; Colorado, any parent unable to care for a child but otherwise a proper guardian; Illinois, widow or woman with husband totally incapacitated; Idaho, widow or woman with husband in prison; Iowa, widow or woman with husband in prison or insane asylum; Kansas, widow, divorced mother, or woman whose husband is in prison or insane asylum, totally incapacitated, or has deserted three months; Massachusetts, mother; Michigan, widow, deserted wife, unmarried or divorced mother but otherwise a proper guardian; Minnesota, widow or woman with husband in prison, insane asylum, or totally incapacitated; Missouri, widow or woman with husband in prison or insane asylum; Montana, widow or woman with husband in prison or insane asylum, or unable to work; Nebraska, any parent unable to care for a child but otherwise a proper guardian; Nevada, any parent or grandparent; Nevada, widow or woman whose husband is in prison or insane asylum, is totally incapacitated, or has deserted one year; North Dakota, mother, if a proper guardian; New Hampshire, mother; New Jersey, widow; New York, widow; Ohio, widow or woman with husband in prison or totally incapacitated who has deserted three years, if otherwise a proper guardian; Oklahoma, widow or woman with husband in prison or insane asylum; Oregon, widow or woman with husband in prison, insane asylum, or totally incapacitated; Pennsylvania, widow, or deserted wife; South Dakota, widow, or woman with husband in prison or totally incapacitated; Tennessee, widow, or woman with husband unable physically or mentally to support children, if otherwise a proper guardian; Utah, mother; Washington, widow, or woman with husband in prison or insane asylum, totally incapacitated or has deserted one year; Wisconsin, any parent or guardian; Wyoming, widow, or woman with husband in prison or permanently incapacitated, or has deserted one year, if otherwise a proper guardian. California has given a broad interpretation to its law through its Supreme Court, which practically holds that the mothers' pension fund is as much a public fund as is the public school fund. The average allowance per month for a widow's pension in New York is \$24.77; in Massachusetts, \$24.42; in Cook County, Ill., \$23.28; and in California, \$21.70.

**NEW YORK CITY.** The New York City Board of Child Welfare had far more applicants for widows' pensions than it had funds to provide. Of the 157 allowances granted, the largest was \$60 a month to a mother with seven children, and the smallest \$5.82 a month. In April the Senate passed a bill which amended the widows' pension act by eliminating the charities commissioner of New York and the charities department from the administration of that law.

**MARYLAND.** In the early part of the year Maryland's Legislature passed a mothers' pension bill. An appropriation of \$50,000 was made for distribution among the commissioners of the counties for cost of administration of the pension funds, and the sum of \$10,000 to a board of mothers' relief for a similar purpose in Baltimore.

For a compilation of laws consult W. E. Hannan, *Mothers' Pension Legislation in New York and Other States* (Albany, N. Y., State Library, 1916).

**PEOPLE'S PHILHARMONIC ORCHESTRA.** See MUSIC, *Orchestras*.

**PERAK.** The most northerly state of the Federated Malay States, noted for its tin mines. See FEDERATED MALAY STATES.

**PÉREZ LUJÍN, ALEJANDRO.** See SPANISH LITERATURE.

**PERIM.** A dependency of Aden (q. v.).

**PERISCOPE.** See SUBMARINES.

**PERKIN MEDAL.** See CHEMISTRY, INDUSTRIAL. *Medals*.

**PERSHING, JOHN JOSEPH.** American soldier, prominent in connection with the troubles between the United States and Mexico. In 1916 Pershing was promoted from brigadier-general to major-general. See MEXICO, *History*.

**PERSIA.** A constitutional Asiatic monarchy, hereditary in the Shiite dynasty of the Kajars since 1794; it lies between the Caspian Sea and the Gulf of Oman. Teheran is the capital.

**AREA, POPULATION, ETC.** The area is estimated at 1,645,000 square kilometers (635,135 square miles), and the population at about 9,000,000, of whom about 2,500,000 are nomads. The country is for the most part an arid tableland enclosed on three sides by mountains rising in the north to over 18,000 feet. A salt desert occupies the central and eastern portions. The Karan is the only navigable river. The principal products are cereals, cotton, tobacco, opium, gums, dried fruits, and silk. The country possesses valuable mineral resources, little worked except for the oil fields in the south. The nomads graze herds of sheep and goats and bring a fine grade of wool into the market. The forests are valuable. Carpets, shawls, and silk and cotton fabrics are manufactured.

**COMMERCE AND COMMUNICATIONS.** The total imports in 1914-15 are placed by a British authority at £8,322,030 and the exports at £6,600,960; 1913-14, £11,766,633 and £8,287,993. The chief products for export, together with the imports for consumption, are shown in the table below, with values in the 1913-14 trade in thousands of krans:

Imports	1000 kr.	Exports	1000 kr.
Cottons	201,018	Fruits	70,384
Sugar	170,519	Carpets	53,677
Tea	88,602	Cotton	85,236
Gold and silver bars		Fish	7,886
and coins	14,904	Rice	42,197
Petroleum	10,199	Gold and silver	
Cotton yarn	18,721	coins	16,924
Flour	16,959	Gums	12,924
Woolens	18,416	Opium	87,714
Indigo, etc.	8,782	Wool	12,408
Haberdashery	12,734	Cocoons	13,449
Rice	8,782	Skins	7,984
Spices	5,504	Animals	10,760
Wool	3,891	Silk stuffs	5,573
Animals	2,145	Cottons	2,284
Silks	7,005	Hides	19,656
Tin, zinc, and lead	2,314	Wheat and barley	4,098
		Pearls	1,428

Russia had first place with exports and imports in 1913-14, valued at £5,492,021 and £6,470,693 respectively; Great Britain, £1,038,378 and £3,235,540; Turkey, £870,310 and £406,155; Germany, £53,696 and £552,230; France, £83,440 and £356,891; Austria-Hungary, £13,059 and

£162,210; Belgium, £4079 and £279,855; Afghanistan, £54,025 and £88,834; Italy, £190,428 and £101,783; Oman, £131,034 and £39,397; China, £20,761 and £9715; United States, £185,540 and £4064. Vessels entered (1913-14) at Persian Gulf ports registered 1,998,561 tons, of which 1,523,639 tons British; at Caspian ports 797,850 tons, all Russian. Merchant marine, one sailing vessel of 107 tons net.

The formal opening of Persia's first railway line between Tabriz and Julfa took place May 8th. A regular passenger and freight service on the line was planned and the portion of track opened was a link in the projected railway system which, when completed, would connect Teheran and Persia generally with Europe. Julfa is on the Russo-Persian frontier, and Tabriz, which is about 80 miles south, is an important town in Northern Persia, having been occupied by the Russians, as within their sphere of influence laid down in the Anglo-Russian convention of 1907. The Tabriz-Julfa railway in 1916 was the only real railway in Persia. There was a small line from Teheran to Shah Abdul Azim, a distance of six miles, but it was more a light railway than a regular line.

**FINANCE AND GOVERNMENT.** Under the Anglo-Russian convention, the collection and expenditure of all revenues were placed under supervision of a European treasurer-general. This office, assumed by M. Heynssens Sept. 1, 1914, was resigned by him in April, 1915, upon an attempt to reduce his power to that of a mere clerk; but in March, 1916, he was reappointed and resumed his office. No accurate statement of revenue can be given, as a large part is derived from taxes in kind. The burden of taxation falls heavily upon the lower classes. The expenditure regularly exceeds the receipts. The Russian loan of 1900 is for 22,500,000 rubles; of 1902, 10,000,000 rubles; of 1913, 2,000,000. The British loans of 1910 and 1911, £2,675,181 at 5 per cent; loans of 1912, 1913, and 1914, £490,000 at 7 per cent. Floating debt, 104,870,000 krans; annuities, 14,000,000. The exchange value of the krans is about 8.75 cents. The reduction of customs receipts since the autumn of 1914 has crippled the government so that interest on foreign loans has not been met. Probably £300,000 are overdue the Russian government and £30,000 the British and Indian governments. The reigning monarch is Ahmed Shah Kajar (born 1898); regent Abou'l Kassim Kahn Nasr-el-Mulk left for Europe after the coronation, July 21, 1914; the heir presumptive, Mohammed Hassan Mirza (born 1899), brother of the shah. Of actual government properly so-called there is none. The country is roamed by warring tribes who live by murder and rapine. The caravan routes are infested with brigands. The provincial governors have nominal but no actual control and no power to suppress feuds between tribal factions; the central government remains powerless to help them. Elections to the national council (Mejliss) were held (for the first time since its dissolution in December, 1911) in the summer of 1914.

**HISTORY.** There were complaints of an active campaign on the part of German and Turkish agents to undermine the influence of the Allies. Although Persia had acquiesced in the Anglo-Russian policy of 1907 and had given her adherence to it as late as 1912, it was said that

the country was falling more and more under the influence of the Germans and the Turks, while French influence was inadequately maintained. In France the resumption of the policy for extending French influence in Persia was much discussed. The Russian forces which had entered Persia toward the close of the preceding year continued to advance. A body of them took Sultanabad on January 21st. Another passed along the canal route from Hamadan toward Bagdad. In Western and Central Persia the Russians continued in occupation until July, when the Turks recaptured Kermanshah. The Anglo-Egyptian expedition, under General Sykes, occupied the southeastern corner of the country. The ministry of Prince Firman Firma, which had held office since Dec. 25, 1915, fell from power in March and the Sipah Salar Azam, former premier and war minister, assumed office. For a detailed account of the military operations in Persia, see **WAR OF THE NATIONS**.

**PERU.** A South American republic, bordering the Pacific between Ecuador and Chile.

**AREA, POPULATION, ETC.** The area and the population of Peru are not definitely known. Unsettled boundaries involve many thousand square miles. If certain lines be taken as the probable final boundaries, an estimate of 1,769,804 square kilometers (683,335 square miles) is reached. A 1913 estimate of population was 5,800,000. It is generally believed, however, that 4,500,000 is more nearly correct. Some observers hold that the population is not increasing. Probably more than one-half of the people are Indians; most of the remainder are mestizos. The estimated population of Lima is about 150,000; Arequipa, 35,000 to 40,000; Callao, 35,000; Cuzco, 30,000 (very likely too high an estimate); Ayacucho and Iquitos, each 20,000. The population of the Amazon port, Iquitos, varies much with the season, from perhaps 30,000 during the high-water period to 18,000, or even to 12,000, in the dry season, when the rubber gatherers are out.

Elementary instruction is nominally but not actually compulsory, and illiteracy prevails throughout the country. There are about 2250 public primary schools, with an enrollment of about 150,000 pupils. The government maintains 27 "colleges," and there are a few other secondary schools and private schools of various grades, and several institutions for special instruction. The old University of San Marcos at Lima has faculties of law, medicine, theology, philosophy and letters, mathematics and science, and political and administrative science. There are also universities at Cuzco, Arequipa, and Trujillo. The state religion is Roman Catholicism.

**PRODUCTION AND COMMERCE.** The most important crops commercially are sugar cane and cotton. Rubber, gathered in large quantities in the northeastern districts, is one of the chief exports, being shipped down the Amazon from Iquitos. Other important products are coffee, rice, corn, wheat, cacao, tobacco, and coca. Sugar production in 1914, 228,055 tons; in 1915, 262,841 tons. Cotton production in 1912, 375,651 quintals (of 101.4 pounds); in 1913, 523,456; in 1914, 487,065. The production of alcohol amounted to 10,961,055 litres in 1914 and 10,121,005 litres in 1915. Alpaca, sheep, and llama wool are exported. Peru has rich mineral deposits, which have been its principal source

of wealth. The chief metals mined are copper and silver. The copper output in 1915 is reported at 32,410 tons. Other minerals exploited to some extent are gold, coal, lead, and petroleum. Petroleum output in 1914, 252,666 tons.

Imports and exports have been valued as follows, in libras (the Peruvian libra is equivalent to the pound sterling, or \$4.86656):

	1911	1912	1913	1914	1915
<b>Imports:</b>					
	5,488,247	5,157,686	6,088,777	4,827,930	3,095,545
<b>Exports:</b>					
	7,416,028	9,488,581	9,137,780	8,767,790	14,123,071

Leading imports in 1913 and 1914 respectively: cotton, woolen, and silk goods, £664,601 and £580,460; timber, £312,724 and £314,009; coal, £301,321; wheat, £256,319 and £212,004. Principal exports in 1913 and 1914: sugar, £1,412,660 and £2,640,952; cotton, £1,564,844 and £1,515,742; copper, £1,682,686 and £1,430,360; petroleum, £910,227 and £888,672; rubber, £815,824 and £447,792.

Imports and exports by principal countries, in thousands of libras:

	Imports		Exports	
	1913	1914	1913	1914
United States .....	1,755	1,571	3,083	3,047
United Kingdom .....	1,599	1,339	3,403	3,274
Germany .....	1,056	647	610	329
Belgium .....	884	275	249	82
Italy .....	254	202	2	10
France .....	280	156	322	153
Chile .....	213	90	1,203	1,282
Others .....	547	550	815	591
<b>Total .....</b>	<b>6,089</b>	<b>4,828</b>	<b>9,138</b>	<b>8,768</b>

**COMMUNICATIONS.** The following information concerning Peruvian railways is taken from a monograph published by the Pan-American Union in 1916:

"The railways in operation in the republic have an extent of 2766 kilometers (1718 miles), of which 2092 kilometers (1300 miles) are standard and the rest narrow gauge. In this mileage is included 45 kilometers (30 miles) of interurban electric lines, all standard gauge. There are also about 5500 kilometers (3418 miles) of line being constructed and under survey.

"The Peruvian railways are to a great extent owned by the government, and some 1800 kilometers (1120 miles) or 65 per cent of these lines are operated by the Peruvian Corporation (Ltd.), under arrangements made with that corporation. The Peruvian Corporation (Ltd.) also owns and operates a line of steamers on Lake Titicaca, the highest navigated body of water in the world, and by the purchase in 1910 of the Guaqui-La Paz Railroad in Bolivia it established a through route between Mollendo, on the Pacific coast, and the Bolivian capital. . . .

"The Central Railway is the most important line in the country, running from Callao through Lima, the capital, to Oroya, over 140 miles (225 kilometers) of track, with an extension from the later point to Huancayo, 78 miles (126 kilometers) farther. The Cerro de Pasco Railway . . . runs from Oroya to Cerro de Pasco, the location of the largest copper mines in the world, situated at an altitude of 12,178 feet

(3712 meters) above sea level. The Central Railway is remarkable from the fact that on its short branch to Morococha the line reaches a height of 15,866 feet (4835 meters), the highest point of any railroad now in operation in the world.

"Second in importance is the Southern Railway, extending from Mollendo to Puno, on Lake Titicaca, a distance of 324 miles (521 kilometers), from which latter point it connects with a line of steamers running to the Bolivian port of Guaqui. From Juliaca, near the shore of the lake, a branch extends to Sicuani and Cuzco. On the Southern Railway, at a distance of 172 kilometers (107 miles) from the coast, is situated the city of Arequipa, which stands at the foot of the far-famed mountain, El Misti. Near Arequipa also is located the Harvard Observatory, which was established at this particular point on account of the clearness of the atmosphere. Arequipa is 7600 feet (2316 meters) above sea level, and the line reaches its highest altitude of 14,866 feet (4470 meters) at Crucero Alto, within a few hours' travel of that city. A remarkable fact in connection with the Southern as well as the Central Railway is that both lines arrive at their high altitudes without the assistance of the rack-rail system, which has generally been found necessary on similar railroads."

According to the above-mentioned monograph, Peru has 340 telegraph offices, with about 10,500 miles of line, and about 800 post offices. There is a radiotelegraph system.

**FINANCE.** The standard of value is gold. The monetary unit is the libra (pound), equivalent to the pound sterling, its par value being \$4.86656. Often the sol is used as the unit of value; 10 soles equal one libra. Revenue and expenditure in 1913 and 1914 and budget estimates for 1915 and 1916 were reported as follows, in libras:

	1913	1914	1915	1916
Rev. ....	3,417,974	2,921,498	2,847,275	2,686,950
Exp. ....	3,318,896	3,015,464	2,978,479	2,920,159

Estimated receipts from customs in 1915, £971,534; taxes, £793,619; monopolies, £820,034. Estimated disbursements in 1915, by departments: finance and commerce, £997,172; war and marine, £724,191; justice and public instruction, £480,761; administration, £476,733; public works, £143,634; congress, £97,941; foreign affairs, £53,047. The total public debt at the end of 1915 is reported at £8,589,679, the internal debt amounting to £702,648, and the floating debt to £1,917,637.

**GOVERNMENT.** The executive power is vested in a president, who is constitutionally elected by direct vote for four years and is ineligible for the next term. He is assisted by a cabinet of six members, appointed by him and responsible to the congress. Two vice-presidents are elected, also for four years, to succeed, in order, to the executive power in case of the president's death or disability. The legislative power is exercised by a congress of two houses, the Senate and the House of Representatives. Senators (52 in number) and representatives (116) are elected by direct vote for six years. The president in 1916 was José Pardo. He was inaugurated Aug. 13, 1915, for the four-year term; on the 10th of that month he was elected



by the congress to succeed the provisional president, Col. Oscar R. Benavides.

Congress, despite the president's non-approval, promulgated a constitutional amendment that granted religious liberty.

The European war adversely affected both Peru and Bolivia, and as a consequence the traffic on the various transportation lines operated by the Peruvian Corporation was seriously diminished during the year ended June 30, 1915. There was a decrease of \$1,194,311 in income as compared with the year ended June 30, 1914. The traffic lines operated by the Peruvian Corporation were as follows: The Central Railway, which includes the Morococha branch and the Oroya-Huancayo extension; the Southern Railway, including the Cuzco extension; the Guaquí-La Paz Railway; the steamers on Lake Titicaca and River Desaguadero; the Ilo-Moquegua Railway; the Trujillo Railway; Paita to Piura Railway; the Pacasmayo and Guadalupe Railway (including the extension to Chilite); the Chimbote Railway; and the Pisco to Ica Railway. It also maintains and administers the Chira Canal. The temporary arrangement with the Peruvian government for the working of the Ilo-Moquegua Railway was terminated in 1915, the line being taken over by the government.

**PETAÏN, HENRI PHILIPPI.** See WAR OF THE NATIONS.

**PETROGAR.** This is a laxative compound made up of two popular purgatives, petrolatum and agar. Each 100 parts contains 72 parts of petrolatum and 22 of agar, with powdered licorice, cocoa, and oil of anise sufficient to flavor.

**PETROLEUM.** Measured by marketed products the year 1915 was the greatest in the history of the crude petroleum industry in the United States. There were produced 281,104,104 barrels, compared with 265,762,535 barrels in 1914, which was at that time the record production. The most significant change in the rank among the oil producing States was that for Oklahoma and California, the former superseding the later for first place by a margin of more than 11,000,000 barrels. Next in importance was the advance of Texas from fourth place in 1914 to third in 1915, by exchange with Illinois. Pennsylvania advanced to seventh place, and Ohio to eighth. The following table gives the production of petroleum in 1914-15 by States in accordance with petroleum marketed:

PETROLEUM MARKETED IN THE UNITED STATES AND AVERAGE PRICE PER BARREL IN 1915

State	1915		Average price per barrel
	Quantity (barrels)	Value	
Alaska	(a)	(a)	.....
California	86,591,535	\$36,558,439	\$0.422
Colorado	208,475	188,485	.880
Illinois	19,041,695	18,655,850	.980
Indiana	875,758	818,895	.929
Kansas	2,828,487	1,702,891	.603
Kentucky	437,274	418,857	.957
Louisiana	18,191,539	10,804,658	.594
Michigan	(a)	(a)	.....
Missouri	(a)	(a)	.....
New York	887,778	1,890,325	1.566
Ohio	7,825,326	10,061,493	1.286
Oklahoma	97,915,243	56,706,133	.579
Pennsylvania	7,898,705	12,431,353	1.586
Texas	24,942,701	18,026,925	.522
West Virginia	9,264,798	14,468,278	1.561

State	1915		Average price per barrel
	Quantity (barrels)	Value	
Wyoming	4,245,525	2,217,018	.522
Other states	b 14,265	b 24,295	1.708
	281,104,104	179,462,890	.638

a Included in "Other states." b Includes Alaska, Michigan and Missouri.

Again in 1916 all previous records for production were exceeded in the petroleum industry of the United States. The United State Geological Survey estimated that during the year 292,300,000 barrels of crude petroleum were produced and marketed in the oil fields of the United States, a quantity greater by 11,000,000 barrels, or 4 per cent, than the output in 1915. In addition to the quantity of oil produced and marketed in 1916, several million barrels were produced and placed in temporary field storage in Kansas and Oklahoma.

The accompanying table shows, by States, the estimate of the production in 1916 in barrels of 42 gallons each:

ESTIMATED UNITED STATES PETROLEUM PRODUCTION, 1916

State	Quantity Barrels
Oklahoma	105,000,000
California	89,000,000
Texas	26,000,000
Illinois	16,500,000
Louisiana	15,800,000
West Virginia	8,500,000
Pennsylvania	8,000,000
Ohio	7,400,000
Kansas	6,500,000
Wyoming-Mont.	6,800,000
Kentucky	1,200,000
Indiana	1,000,000
New York	900,000
Colorado	190,000
Other States	10,000
	292,300,000

The increased production in 1916 was explained by the continued ability of recently developed fields in the mid-continent and Rocky Mountain regions to supply enough oil from new wells to more than offset the normal decline in the older fields east of the Mississippi, as well as by the active development which, especially in Oklahoma, Kansas, and Texas, was remarkably successful. The chief centres of increased production in 1916 were in Estill and Allen counties, Ky., Butler County, Kan., Carter County, Okla., and Converse, Park, and Natrona counties, Wyo.

The incentives that caused the increase in 1916 were chiefly higher prices for oil, which encouraged more drilling than in many years, especially in Kansas, Oklahoma, Texas, and Wyoming, and not infrequently at points far removed from previous developments. There was a decrease in production in the Cushing pool, Okla., which, from over 300,000 barrels a day in 1915, declined to 60,000 barrels a day in 1916. This, however, allowed the product of other mid-continent fields access to markets then being developed with connections direct to both the Lake cities and the Atlantic seaboard. There was also a greatly increased demand for crude oil.

In 1916 there were 302 oil refineries in the

United States, having a total daily capacity of more than 1,000,000 barrels. This exceeded the daily crude petroleum production, but during 1914 and 1915, a time of overproduction and low prices, many refineries were completed. The Standard Oil controls but slightly less than 50 per cent of the total refining capacity, or approximately 495,000 barrels, and was building several additional refining plants.

The total number of refineries was made up of 28 idle and 11 in course of construction, and 265 plants in active operation. California had 76 refineries of which 19 were idle and 57 active. The total investment in oil refineries in the United State was put at \$425,000,000.

With about 40 new refining plants projected the daily refining capacity of the United States will be increased to nearly 1,200,000 barrels per day when in maximum operation.

The year 1915 was one of notable expansion in the domestic market for petroleum fuel. The continued over-production of crude oil in Oklahoma supplementing, by the increased output of refinery residuums provided, the surplus of fuel grades of petroleum, supplied by the Gulf coast fields, resulted in a confidence in the future supply and a current market price of greatly stimulated fuel oil consumption. This was particularly notable in the Southwest, where railroad and industrial plants of all types adjacent to the source of supply adopted it to the exclusion of coal. Owing to the conditions of ocean transportation by the United States and foreign ports the number of tankers available for service between the United States and Mexico was increasing, with the result that imports of fuel oil from that country showed a decided increase in 1915.

**PRICES OF CRUDE OIL.** Notwithstanding the increased production, the prices of crude petroleum at the wells were higher in 1916 than in 1915. From the beginning of 1916 the market continued to advance until March, when a period of relative stability was attained. Pennsylvania grade advanced from \$2.25 to \$2.60 a barrel and Oklahoma-Kansas grade from \$1.20 to \$1.55 a barrel, with a premium of 50 to 60 cents for the product of the Cushing pool. The high prices were maintained until the middle of July, when a general retrogression in prices took place which lasted until the curtailment of production in certain newer fields prevented further reduction, and later there was an advancing market which put the prices for such typical grades as Pennsylvania at \$2.85 and Oklahoma-Kansas at \$1.40 a barrel.

The use of petroleum for fuel along the Atlantic seaboard is rapidly and steadily increasing. In New England it is coming to quite general use in the large textile and paper mills, in small industries, and even in domestic heating plants. The use of petroleum on American merchant ships, especially in the Pacific, is almost general. Complete statistics of the consumption of fuel oil in the United States are not available, but estimates indicate that about 48,860,000 barrels of domestic crude oil were delivered for fuel purposes in 1915. In addition more than 16,000,000 barrels were imported from Mexico. There was a decided increase in the consumption by railroads. The consumption of fuel oil by the United States navy during the fiscal year ending June 30, 1916, was approximately 47,000,000 gallons. For Rittman Proc-

ess, see **CHEMISTRY, INDUSTRIAL.** See also **GEOLOGY.**

In 1916 the gasoline situation was of unusual interest, for with the higher prices for oil the prices for gasoline increased and from a wholesale price of 21 cents a gallon on Jan. 1st, there was a progressive advance to 24 cents on March 24th, which was maintained until August, when a decline began that reached 22 cents on September 5th. With the retail price to the consumer about six cents in excess of these figures, the interest of over 2,250,000 motor car owners in the United States in gasoline production may be appreciated and the possibilities of a gasoline famine were discussed. In 1916, in addition to the usual methods of refining, some 5,000,000 barrels of gasoline were being made by the "cracking" process as compared with about 2,000,000 barrels in 1915, and this from grades of oil that never previously entered into the manufacture of gasoline. There was an increased production of so-called blended gasoline where casing-head gasoline, a volatile product obtained from natural gas, was being blended with oil just a little lighter than kerosene.

**WORLD'S PRODUCTION.** The following table shows the world's production of petroleum in 1915 in so far as statistics are available:

**WORLD'S PRODUCTION OF CRUDE PETROLEUM IN 1915**

Country	Production 1915		Percent- age of total
	Barrels of 42 gallons	Metric tons	
United States . . . . .	a 281,104,104	a 37,480,547	65.78
Russia . . . . .	68,548,062	9,358,077	16.09
Mexico . . . . .	82,910,508	4,388,068	7.69
Dutch East Indies b	12,886,808	1,710,445	2.90
Rumania . . . . .	12,029,913	1,673,145	3.81
India . . . . .	8,202,674	1,093,690	1.92
Galicia . . . . .	4,158,899	578,888	.97
Japan and Formosa	3,118,464	415,785	.78
Peru . . . . .	2,487,251	331,633	.58
Germany . . . . .	995,764	c 140,000	.23
Trinidad . . . . .	c 750,000	100,000	.18
Argentina . . . . .	516,120	75,900	.12
Egypt . . . . .	221,768	29,569	.05
Canada . . . . .	215,464	28,729	.06
Italy . . . . .	89,548	c 5,500	.01
Other countries . .	c 10,000	1,333	.01
	427,695,347	57,405,809	100.00

a Marketed production. b Includes British Borneo. c Estimated.

**PETROLOGY.** See **GEOLOGY.**

**PETT RIDGE, W.** See **LITERATURE, ENGLISH AND AMERICAN, Fiction, English.**

**PHILADELPHIA SYMPHONY ORCHESTRA.** See **MUSIC, sections Orchestras and Novelties.**

**PHILIPP, EMANUEL L.** Relected Republican Governor of Wisconsin, Nov. 7, 1916. See **WISCONSIN.**

**PHILIPPINES. AREA AND POPULATION.** The total area of the islands is 115,026 square miles. The estimated population in 1916 was 8,834,187. The last census of the Philippines was taken in 1903, when the population was 8,265,348.

**AGRICULTURE.** Agriculture, the basis of all Philippine wealth, is the department in which the American government has made the least progress. In some parts of the islands agriculture has never recovered from the destructive effects of the wars of insurrection against Spain and the United States. In former days the Philippines

were actually exporters of rice, while now from 12,000,000 to 15,000,000 pesos go out of the country every year, for rice is the staple article of food. Efforts have been made to educate the Filipinos into making more diversified crop production, and this has had some success. The Bureau of Agriculture has been active in the endeavor to bring about reforms in seed selection, irrigation, and fertilization. The chief hindrance to profitable development of the agricultural lands of the islands has been the ravages of the rinder pest and the locust, and although progress has been made, these problems still remain to be solved.

Under the stimulus of the Bureau of Agriculture is the formation of coöperative agricultural societies of which there are now 29 provincial and 295 municipal organizations. In 1914-15 laws were passed for the formation of rural credit associations, for the founding of a government bank with special grade facilities for agriculturists, for the reform of irrigation and water right laws, for the rapid building and extension of the road system, for the grading and classifying of hemp for exports, for the regulation and betterment of the export of cigars to the United States, for improvement in the locust and rinder pest, and for the organization and operation of government aid of sugar and copra centrals. An agricultural colony has been established in Mindanao, Momungan, and gives promise of success. The chief agricultural products of the island are sugar, hemp, copra, tobacco, and rice. The value of these is indicated in the section on commerce below.

**COMMERCE.** The total shipments to the United States from the Philippines in the 11 months ending Nov. 30, 1916, amounted to \$31,443,169, compared with \$20,612,619 for the corresponding period in 1915. The shipments from the United States to the Philippines amounted to \$20,535,379, compared with \$24,885,849 in 1915. The productions of chief value exported to the United States were fibers, including vegetable and textile grasses, valued at \$13,838,501, sugar, valued at \$7,270,956, tobacco, valued at \$1,749,592, fruits and nuts, \$2,004,701, vegetable oil, \$3,117,617. Other exports of some value were chemicals and drugs and hats.

The foreign trade department of the National City Bank of New York City during the year prepared an interesting compilation showing the total trade of the United States with the Philippine Islands during the 16 years which they have been under American control, compared with the 16 years immediately preceding. It is shown that the total exports from the United States to the islands under American control aggregates \$201,000,000, compared with a little over \$2,000,000 in the 16 years preceding annexation. Before annexation the islands seldom exported to the United States products of more than \$200,000 of value per year. In the year following annexation exports amounted to \$2,500,000, and steadily increased until during the last few years they have averaged \$25,000,000, and in 1914 were over \$27,000,000. Imports from the islands, which averaged less than \$5,000,000 per year preceding its annexation, have averaged, since annexation, about \$25,000,000. The total imports from the islands in the 16 years since annexation were \$218,000,000, compared with \$121,000,000 in the 16 years preceding. In the five years immediately preceding

annexation the average was about \$4,500,000 per year. The total exports in 1899 were \$14,847,000, and in 1914, \$48,690,000, while in 1899 the total imports were \$19,193,000, and in 1914, \$48,589,000. In 1899, the year immediately preceding annexation, the total foreign trade of the islands was \$34,000,000. Since annexation the average has been about \$100,000,000. Prior to annexation the United States supplied about 1 per cent of the goods imported by the islands. In 1915 slightly more than 50 per cent were exported from the United States, which took over 40 per cent of their imports. During the 16-year period the Philippines have become the largest cotton goods market of the United States. Other important exports include iron and steel, manufactures, breadstuffs, cars and carriages, leather and manufactures of leather, mineral oils, paper and manufactures of paper, meat and dairy products, and india rubber manufactures. The chief exports are manila hemp, sugar, cocoanut oil, copra, and cigars and cigarettes.

**EDUCATION.** The total number of schools in the islands in December, 1915, was 4386, compared with 4187 in the previous year, and 4235 in 1913. The average daily attendance increased from 428,552 in 1913 to 473,213 in 1915. In the Philippines a large portion of the total number of pupils is in the primary schools, but the intermediate or secondary schools have also made a striking increase in recent years due in part to private subscriptions to the school funds. A large share is played by athletics in the school curriculum, and this is proving of great benefit to the Filipino people. The participation of the Filipino athletic team in the second meet of the Far Eastern Athletic Association in Shanghai in May, 1915, was an unqualified success. In the contest with the Chinese and Japanese athletes the Filipinos won a majority of the field and track events. Education among the non-Christians of the islands is greatly on the increase. Since 1914 the appropriations have practically developed and the first act passed by the Legislature in the session of 1915-16 was the setting aside of 1,000,000 pesos for new primary school work among the non-Christians. In this class of education particular importance is attached to industrial or technical studies, and less time is devoted to the purely academic. The school enrollment in the Mountain Province in 1915 nearly doubled, and in the departments of Mindanao and Sulu still more striking progress was made. In these departments among the Mohammedan and pagan populations, the greatest activity was noticeable in the opening of new schools, for which there is a genuine demand among the people. There were 273 teachers engaged in the work in 1915. Of these only 14 were Americans. The insular appropriations for schools in 1915 was 4,259,000 pesos, while 725,000 pesos were contributed to the university, and 731,189 pesos were spent in the construction of new school buildings. The University of the Philippines is progressing rapidly to a position of importance and influence in Far Eastern affairs. The enrollment is about 2000.

**FINANCE.** The report of the treasury showed a balance on hand on Dec. 31, 1914, of 13,385,908 pesos. The receipts from all sources for the fiscal year amounted to 130,851,977 pesos, and the expenditures to 118,104,269 pesos, leav-

ing a balance at the end of the year of 12,747,707 pesos.

**BANKS AND BANKING.** The amount loaned by the agricultural bank during 1915 was 1,221,570 pesos. The number of applications was 441, and the number of loans made was 247. The total resources of the commercial banks in 1915 were 71,542,868 pesos.

**HEALTH AND SANITATION.** By an act of the Legislature the former Bureau of Health Office in 1915 was changed to the Philippine Health Service. A council of hygiene was created with advisory functions, by which the health service is brought into closer consultation with the representatives of the people. There is an undoubted improvement in the general attitude of the people toward sanitation, and the much needed efforts of sanitary work in the provinces has been systematically entered upon. While Manila has heretofore been brought to the position of a model city as far as sanitation and health are concerned, the extension of serious efforts to improve sanitary conditions in the provinces is now being instituted. Generally speaking the Philippines were free from communicable diseases during 1915.

One of the accomplishments, during the year, of science and humanity was the determination to discharge from the Culion leper colony on August 28th, 23 clinically and bacteriologically negative lepers who had been medically treated there.

**CONSTABULARY.** The Philippine Constabulary maintained its high level of organization and efficiency during 1915. On Dec. 31, 1915, there were 341 officers of whom 223 were Americans and 118 Filipinos, and 4981 enlisted men, all Filipinos, in the constabulary.

**PUBLIC WORKS.** A large programme of public works was carried out in 1915. The total expenditures for this purpose amounted to 11,281,282 pesos, an increase of 13 per cent over 1914, including an increase of 108 per cent on port works, and 40 per cent on water supply. At the end of the year there were 3068 kilometers of first class road in the islands, an increase of 20 per cent over 1914, 2082 of second class, and 3052 of third class, making a total of 8002 kilometers. During the year a new concrete wharf was constructed at Iloilo, Manila.

**CHARITIES AND CORRECTIONS.** A prisoners' court was established at Bilibid prison for the trial of offenses against prison regulation and discipline. All the members of the court are prisoners, and of the 2000 cases determined by them the director of the prison modified only 5 per cent. The Iwahig penal colony so increased its food products during the year as to reduce the cost of rations. A new record was also made in that for the first time there were no escapes from the colony, and no serious injuries from violence.

**RAILWAYS.** The report of the operation of the Philippine Railway Company's lines in the Philippine Islands for the year ended Dec. 31, 1915, showed a total revenue of \$362,407 as against \$361,219 in 1914. Total expenses for 1915 were \$243,035, against \$232,705 in the previous year. The net operating revenue was \$119,372, as compared with \$128,424 in 1914, a decrease of 7.05 per cent for 1915.

The Manila Railroad was sold to the Philippine government for \$4,000,000 and the sale was ratified on Sep. 8, 1916. This line, which is

the only one on the Island of Luzon, has 350 miles of track.

**POLITICS AND GOVERNMENT.** The most notable incident relating to the Philippines during the year was the enactment by Congress of a new Organic act which was approved by President Wilson on Aug. 9, 1916. An account of the passage of this bill through Congress follows.

In the 63rd Congress in 1915 there was introduced in the House of Representatives what was known as the Jones bill, prepared under the leadership of Chairman Jones of the House Committee on Insular Affairs. The expressed object of the bill was to increase self-government in the islands, but in the preamble there was stated the intention of the United States to give the islands independence at some unnamed date in the near future. In the 64th Congress this bill, somewhat revised by the Senate, was reintroduced. For the most part it was a very elaborate code of fundamental provisions, resembling to some extent the State constitutions. The bill passed the House and in the Senate was amended, among other details, by a provision or by a section providing for the immediate evacuation and abandonment of the Philippines. This amendment was offered by Senator Clarke of Arkansas, and after an extended debate was adopted. The clause provided for the withdrawal of the American government from the islands within two years after the enactment of the bill, although the period may be extended by the President for two years longer if he deems it necessary. In spite of this expressed determination to abandon the islands within so brief a time the remainder of the bill is devoted to the formulation of an elaborate system of government, which could not be perfected within the period named for withdrawal. Mr. Garrison, at the time Secretary of War, protested strongly against the bill, calling the Clarke amendment "an abandonment of the duty of this nation and a breach of trust toward the Filipinos." President Wilson, replying, admitted that in his judgment the Clarke amendment was unwise at this time. He continued, however, "It would clearly be called indefensible for him to take a position that he must dissent from that action should both Houses of Congress concur in a bill embodying that amendment. That is a matter upon which I must withhold judgment until the joint action of the two houses reaches me in definite form. What the final action of the two houses will be no one at this time can certainly forecast."

The vote in the Senate on the Clarke amendment was a tie, but was decided by the vote of Vice-President Marshall. Upon the final vote as a whole, including the Clarke amendment, the measure passed with 52 affirmative and only 24 negative votes. Five Republicans voted with the Democrats. These were Borah, Kenyon, La Follette, Norris, and Works.

In the House of Representatives strong opposition developed to the promise of independence at a definite time. The Clarke amendment, which would have decreed the withdrawal of the United States from the islands within four years and which had passed the Senate, was defeated in the House by a vote of 113 to a vote of 165. Thirty Democrats joined the Republican minority in voting against the amendment. Two attempts to retain the provision in a modified form were defeated. The first of these set the

time from two to six years, the second a minimum of four years and a maximum of eight years. Having defeated these amendments the House then voted to substitute for the measure as it came from the Senate the Jones bill, which merely declared in its preamble that it had always been the intention of the United States to grant freedom to the Philippines. The bill was then sent to conference and House conferees were instructed to agree to no declaration in the bill setting a definite time for giving freedom to the Filipinos. The bill was finally agreed upon, and became a law on Aug. 29, 1916.

The first Philippine Congress consisting of a Senate and House of Representatives, created by the bill passed by the 64th Congress, convened in Manila on October 16th. For the first time in the history of the islands the non-Christian tribes were represented in the legislative branch of the government. Governor Harrison confirmed the appointments to the Senate of a Senator representing the Moro Province, and another representing the Mountain Province.

A measure passed at the 1916 session of the Insular Legislature permitted government employees, after a certain term of service, to retire with a full year's pay. This measure, together with the growing uncertainty of American office holders as to their tenure of office, in view of the policy of the government to advance Filipinos to high offices led to a number of resignations. Harry F. Edwards, for 15 years Director of Agriculture, resigned, and Andriano Hernandez, Assistant Director, was promoted to take his place. He is the first Filipino to hold an administrative office of such rank. Stephen Bonsol also resigned as member of the Board of Utility Commissioners, and the vacancy was filled by a native. A still more interesting promotion was that of Joaquin de Luna to the governorship of the Mountain Province, inhabited by the Igorrotes and other semi-savage tribes. Under Governor Luna several American sub-governors are serving.

On January 20th the Department of Commerce announced that the Coast and Geodetic Survey and Bureau of Lighthouses had recently surveyed and marked a safe passage through the Sulu Sea, a body of water covering over 50,000 square miles extending from the southeast corner of Palawan to the northeastern corner of Mindanao, and from the northeast corner of Borneo to the southwestern extremity of Panay. Heretofore over this great area there had been little known of the great depths and isolated sand cays, and coral reefs, except for a few scattered soundings and markings made by early navigators, which were of little practical use in the navigation of modern steamships.

**STATE OFFICERS.** The Governor-General in 1916 was Francis Burton Harrison.

**PHILLIPOTS, EDEN.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, English.

**PHILOLOGY, CLASSICAL.** In 1916, far more even than in 1915, American students of classical matters were cut off from access to foreign publications in their fields, especially books and periodicals published within the domains of the Central Powers. For many months it has been impossible for an individual to import books or periodicals from these domains. Of necessity, therefore, this article will be confined almost wholly to American and English work in classical philology.

To the *Loeb Classical Library* (see YEAR BOOKS for 1911, 1912, 1913, 1914, 1915) were added, on the Greek side, translations of the *Greek Anthology* (the first of five volumes), by W. R. Paton; Marcus Aurelius Antoninus, *Meditations and Speeches*, by C. R. Haines; of Dio Cassius (the fourth of nine volumes), by E. Cary; of Galen, *On the Natural Faculties*, by A. J. Brock; of Lucian (the second of seven volumes), by A. M. Harmon; of Plutarch (the third and fourth of 10 volumes), by B. Perrin; of Procopius (the second of six volumes), by H. B. Dewing; of Theophrastus, *Enquiry into Plants and Minor Works on Odours and Weather Signs* (two volumes), by Sir A. Hort; and, in one volume, Longus's romance, *Daphnis and Chloe* (by S. Gaselee) and Parthenius's *Love Romances* (G. Thornley's translation, revised by J. M. Edmonds). On the Latin side there were added Plautus (the first of four volumes), by P. Nixon; Ovid, *Metamorphoses* (two volumes), by F. J. Miller; Vergil (the first of two volumes), by H. R. Fairclough. There have been many translations of Greek and Latin writings as individual efforts, not parts of such a coordinated series as the *Loeb Classical Library*. But for these, important as they often are, there is no space to list here.

Parts I and II of Volume 11 of the *University of Michigan Studies, Humanistic Series*, contained important works by American scholars, of the University of Michigan, the one a mathematician, the other a classical scholar. The former, by L. C. Karpinski, was an edition of *Robert of Chester's Latin Translation of the Algebra of Al-Khwarizmi*; it contained the Latin text, an English version of the text, Introduction and Critical Notes. A review of the book by D. E. Smith, a mathematician, in *Science*, March 17, 1916, and another by M. W. Humphreys, a distinguished classical scholar possessed also of marked mathematical genius and knowledge, in *American Journal of Philology*, xxxvii, 354-357, give a good idea of the importance in the history of science of the original work. The other work, by J. G. Winter, is an English version, accompanied by an Introduction and Explanatory Notes, of *Nicolaus Steno's Dissertation Concerning a Solid Body enclosed by Process of Nature within a Solid*.

In the United States four periodicals deal with classical matters only. Two of these, the *American Journal of Philology* and *Classical Philology*, make appeal primarily to scholars; they are repositories of articles embodying the results of original research. The others, the *Classical Journal* and the *Classical Weekly*, are concerned primarily with the presentation of the value of the classics, and with the pedagogy of the subject. But both contain articles informational in character, embodying, too, at times, some measure of original research. The reviews in the *Classical Weekly* are particularly valuable; these are often real contributions to the subjects involved in the books under review.

In vol. xxxvii of the *American Journal of Philology* were published "The Latest Expansions of the *Iliad*," G. M. Bolling (an effort to determine, on the basis of our manuscripts and the papyri, the earliest form, uninterpolated, of the text of the *Iliad* now accessible to us); "The Latin Grammarians of the Empire," W. M. Lindsay (some observations on the writings grouped in the seven volumes of H. Keil's well

known work, *Grammatici Latini*); "A with the Future," H. N. Sanders; "Pro Domo Mea," E. W. Fay (etymological investigations); "Later Echoes of Calpurnius and Nemesianus" (Roman writers of pastoral poetry), W. P. Mustard; "Notes on Tibullus," K. F. Smith (supplementary to his edition of *Tibullus*, noted in the YEAR BOOK for 1913); "Mimnermus and Propertius," D. B. Durham (the article challenges Wilamowitz' view that Mimnermus was an important source of the Cynthia book of Propertius' *Elegies*); "The Origin of the Indo-European Nominal Stem-Suffixes," W. Peterson; "Cæsar B. G., III, 12, 1,—A Review and an Interpretation," S. G. Oliphant (an interesting discussion of the passage, long debated, in which Cæsar, while describing his naval operations against the Veneti in Northwestern Gaul, makes a puzzling allusion to the tides); "A Point in the Interpretation of the Antigone of Sophocles," C. Knapp (the author, by calling attention to a recurrent "Think, think," "Be wise" motif, seeks to support the view that the poet held Antigone entirely guiltless); "The Personality of the Epicurean Gods," G. D. Hadzaitis; "Molle atque Facetum," M. B. Ogle (an interpretation of the famous phrase used by Horace, *Satires* i.10.40, of Vergil's *Eclogues*: the author attacks the explanation of the phrase advanced, in an elaborate article in *Harvard Studies*, xxv, by C. N. Jackson); "The Greek Article in First and Second Century Papyri," F. Eakin; "The Article before the Genitive of the Father's Name in Greek," C. W. E. Miller (now Assistant Editor of the *American Journal of Philology*); "The Semantics of Latin Adjective Terminations," E. W. Nichols (a discussion of Latin adjectives from the point of view of relation between stem and termination); "The Latest Expansions of the *Odyssey*," G. M. Bolling; "The Suffix *μα* in Aristophanes," C. W. Peppler. Reviews of special importance in this volume are those of J. E. Sandys, *The Odes of Pindar* (part of the *Loeb Classical Library*) and of J. H. Rendel, *The Origin of the Cult of Artemis*, both by B. L. Gildersleeve, editor of the *American Journal of Philology*; W. Leaf, *Homer and History*, by F. G. Allinson; M. Clerc, *Aquæ Sextiæ: Histoire d'Aix-en-Provence dans l'antiquité*, by R. V. D. Magoffin; C. Pascal, *Poeti e Personaggi Catulliani*, by B. L. Ullman. In the department known as "Brief Mention," Professor Gildersleeve wrote on a wide variety of topics. Finally, there were useful summaries of the contents of several foreign classical periodicals: of *Hermes*, xlvi-xlvii, by H. L. Ebeling; of *Glotta*, vi, by F. Edgerton; of *Philologus*, lxxiii, by G. D. Kellogg; and of *Romania*, by G. C. Kaidel.

From *Classical Philology*, edited by Paul Shorey, may be noted "Petronius, Poggio, and John of Salisbury," E. T. Sage (an argument that John of Salisbury had knowledge of all of Petronius, whereas we now know only parts, but that there is no evidence that he possessed a manuscript of Petronius); "The New Critical Edition of Ovid's *Metamorphoses*," E. K. Rand, an adverse review, in effect, of the elaborate text-edition of the *Metamorphoses* published in 1914 by H. Magnus, a work hailed at once with acclaim (see YEAR BOOK for 1914); "The *Magistri* of Campania and Delos," A. E. R. Boak (an examination of the position of certain officers, known as "Masters," in these two widely

separated communities: in spite of the wide separation of the communities the officers were much the same); "The *Aparrides* of Cratinus and the Eleusinian Tax Decree," R. H. Tanner (a discussion of the nature and date of a play of Cratinus, one of the three greatest masters of the Old Attic Comedy: the author puts the play in the spring of 442 B. C.); "The Interpretation of Roman Comedy," H. W. Prescott (an examination of the dominant tendencies in the higher criticism of Plautus, the Roman comic writer, of the weakness of modern method here, and of the possibility of safer courses of procedure); "Contradictions in the Seasons of the *Odyssey*," J. A. Scott (a refutation of the view advanced by G. Finsler that there is such contradiction and that, in consequence, we must believe that the poem is the result of the union of two stories of independent origin); "Horace an Atticist," M. B. Ogle; "Horace and Valerius Cato," G. L. Hendrickson (an argument that the eight verses prefixed in some manuscripts to the traditional opening of that piece, *Nempe incomposito diei pede*, were in fact written by Horace, a view contrary to that long held by scholars in general); "The Lot Oracle at Delphi," F. E. Robbins; "On the Expulsion of Foreigners from Rome," R. W. Husband; "Ἐπίκλησις and the Δίκη Νουθευαρχίας," G. M. Calhoun (an examination of the prosecution of perjury at Athens); "Narrative and Speech Scansion in Homer," A. Shewan; "Isocrates and the Epicureans," H. M. Hubbell; "Plutarch's *Alexander* and Arrian's *Anabasis*," R. B. Steele (a study of the extent to which Arrian was influenced by Plutarch); "Latin Diminution of Adjectives," W. Peterson. During the year a General Index to volumes i-x of *Classical Philology*, prepared by F. E. Robbins, was published.

From the *Classical Journal*, edited by F. J. Miller, we mention "The Varus Episode," by W. A. Oldfather (a fresh examination of the defeat of Varus, in the Teutoberg Forest, in 9 A. D., by Arminius), an abstract of a monograph entitled "The Defeat of Varus and the German Frontier Policy of Augustus," by W. A. Oldfather and H. V. Canter, published in *University of Illinois Studies in the Social Sciences*, iv, in June, 1915 (the authors hold that the importance of the defeat has been greatly exaggerated. For a review of the monograph, by R. V. D. Magoffin, see the *Classical Weekly*, x, 30-31); "The Crooked Plow," by Fairfax Harrison, president of the Southern Railway, and a skilled farmer (the paper takes issue strongly with interpretations by classical scholars of Roman descriptions of Roman plows); "Influence of Alexandrian Poetry upon the *Æneid*," by Eleanor S. Duckett; "Fortunatus Et Ille," by T. Frank (an attempt to answer the question why the Greeks and the Romans, who lived in the fairest of lands, speak, on the whole, rather infrequently of the beauties of nature); "Some Features of Ovid's Style: I. Personification of Abstractions," by F. J. Miller; "Election Laws in Republican Rome," R. W. Husband; "The International Law of the Gallic Campaigns," M. Radin; "Aristotle's Doctrine of Katharsis and the Positive and Constructive Activity Involved," A. H. R. Fairchild; "On Certain Ancient Errors in Geographical Orientation," E. T. Merrill; "The Sources of the *Odyssey*," J. A. Scott; "The De-

cline of Roman Tragedy," T. Frank; "A Greek Conception of the Constitution of Matter," J. B. Pike.

From the *Classical Weekly*, edited by C. Knapp, may be mentioned "A Lee Shore," by A. R. Wightman (a discussion of Cæsar, *B. G.* iv, 28, 3, in opposition to the views of T. Rice Holmes, the well known English authority on Cæsar); "The Lucretian Theory of Providence," by G. D. Hadzsits; "Correption in Homeric Speech and Narrative," A. Shewan; "The Later Tradition of Vergil," K. F. Smith; "Advertising Among the Romans," E. T. Sage; "Legislation Against Political Clubs During the (Roman) Republic," R. W. Husband; "Roman Literary Characterization," R. B. Steele. Important reviews in this periodical were the following: J. Burnet, *Greek Philosophy. Part I. Thales to Plato*, by R. B. English; M. H. Morgan, translation of Vitruvius, *De Architectura*, by M. N. Wetmore; J. W. White, *The Verse of Greek Comedy*, by M. W. Humphreys; A. Avellanus, *Pericla Navarchi Magonis*, by C. H. Forbes; T. Frank, *Roman Imperialism*, by A. C. Johnson; W. Leaf, *Homer and History*, by F. G. Allinson.

In vol. xlvii of the *Transactions of the American Philological Association* we find, besides other papers, these: "The Year of the Crucifixion," R. W. Husband (an argument that the crucifixion occurred in 33 A. D.); "The Importance of Special Languages in the Study of Vulgar Latin," A. J. Carnoy, of the Universities of Louvain and Pennsylvania; "An Analysis of the Pagan Revival of the Fourth Century, with Especial Reference to Symmachus," D. N. Robinson; "A Science of Style," E. P. Morris, a presidential address to the American Philological Association, at its annual meeting at Princeton, December, 1915; "Elision and Hiatus in Latin Prose and Verse," E. H. Sturtevant and R. G. Kent; "The Clausula and the Higher Criticism," Susan H. Ballou (an application of the doctrine of rhythmical clausulæ to the *Scriptores Historiæ Augustæ*, in investigations touching matters of composition, historical sources, and the like); "The *Ὀδυσσεὺς* of Cratinus and Euripides," R. H. Tanner; "Seneca's Epigrams," K. P. Harrington; "Democritus' Theory of Sense Perception," R. B. English; "Early Cyprian Greek," G. Hempl.

*Harvard Studies*, xxvii, contained three papers: "The Doctrine of Literary Forms," R. K. Hack; "The Historical Socrates in the Light of Professor Burnet's Hypothesis," C. P. Parker (an indication of "the most important consequences of accepting, as I do heartily, the hypothesis of Professor Burnet as to the historical character of Plato's *Phædo*"); "The Chorus of Euripides," A. E. Phoutrides.

The revised edition (second) of THE NEW INTERNATIONAL ENCYCLOPÆDIA was completed during the year, by the addition of volumes 17-24. All the articles in these volumes that dealt in any way with the matters falling within the wide field covered by classical philology were carefully revised by Charles Knapp.

Of the activities of British classical scholars a hint can be given by the mention of a few of the articles in the *Classical Review* and the *Classical Quarterly*, the best known of the English classical periodicals. From the former we mention "The Homeric Hymns," by T. Agar (conjectures on the text of the hymns); "An

Unnoticed Trait in the Character of Julius Cæsar," W. W. Fowler (the author cites evidences of a tendency on Cæsar's part to take an interest, at times, in ancient procedure, especially that of religion); "The New Lyric Fragments," J. M. Edmonds (a discussion, with translation, of the new fragments of Sappho, published in the *Oxyrhynchus Papyri*, Part X); "Jupiter and the Triumphantor," W. W. Fowler; "Constructive Rhythm in Cicero's Speeches," A. C. Clark. Good reviews were those of W. Leaf, *Homer and History*, by A. Shewan; J. W. White, *The Scholia on the Aves of Aristophanes*, by R. T. Elliot; and of W. Ridgeway, *The Dramas and Dramatic Dances of Non-European Races*, by R. R. Marett.

From the *Classical Quarterly* we name "Some Problems in the Grammatical Chapters of Quintilian," F. H. Colson; "Ovidiana," A. E. Housman; "A Criticism of Criteria," W. R. Hardie (observations on the evidence afforded by meter and diction for the date of Latin poems, an argument against the tendency, strong in England in recent years, to ascribe definitely to Vergil certain of the Minor Poems, commonly, however, regarded as by some one other than Vergil); "An Attempt to Date the Composition of Æneid VII," Gertrude M. Hirst.

In the absence of information about foreign publications, referred to above, it is not possible to set down here, in classified form, as in preceding editions of the YEAR BOOK, lists of books and articles in various fields, not covered above. It remains, then, only to jot down the names of some books that have come to the writer's attention in 1916: editions, in revised forms, of the *Wasps* and the *Clouds* of Aristophanes, by B. B. Rogers; K. Reinhardt, *Parmenides und die Geschichte der Griechischen Philosophie*; Lane Cooper, *A Concordance to the Works of Horace* (published by the Carnegie Institution of Washington); W. W. Fowler, *Virgil's Gathering of the Clans, Being Observations on Æneid VII, 608-817*; J. A. K. Thomson, *The Greek Tradition: Essays in Reconstruction of Ancient Thought* (a collection of essays on classical subjects); H. Taylor, *Cicero: A Sketch of His Life and Works*; C. E. Boyd, *Public Libraries and Literary Culture in Ancient Rome*; C. H. Moore, *The Religious Thought of the Ancient Greeks*; M. Radin, *The Jews among the Greeks and Romans*; W. S. Fox, *The Mythology of the Greeks and Romans*, one of 13 volumes on the *Mythology of All Races*, published by the Marshall Jones Company, Boston; E. Tavenner, *Studies in Magic in Latin Literature*; J. H. Rendel, *The Origin of the Cult of Artemis*; H. Graillot, *Le Culte de Cybèle, mère des dieux, à Rome et dans l'Empire romain*; Maurice Emmanuel, *The Antique Greek Dance*; R. W. Husband, *The Trial of Jesus* (a study of the trial of Jesus, from the point of view of Roman law); Bertha C. Rider, *The Greek House: Its History and Development from the Neolithic Period to the Hellenistic Age*; Ethel B. Abrahams, *Greek Dress: A Study of the Costumes worn in Ancient Greece from Pre-Hellenic Times to the Hellenistic Age*; E. A. Gardner, *A Handbook of Greek Sculpture*; H. N. Fowler, *A History of Sculpture*; E. S. Bouchier, *Syria as a Roman Province*; R. M. Dawkins, *Modern Greek in Asia Minor: A Study of the Dialects of Solli, Cappadocia, and Pharasa*, with texts, translation, and glossary;

E. Pais, *Storia Critica di Roma durante i primi cinque secoli*, vol. ii; A. Van Buren, *A Bibliographical Guide to Latium and Southern Etruria*; H. W. Smyth, *A Greek Grammar for Schools and Colleges*; J. H. Moulton and G. Milligan, *The Vocabulary of the Greek Testament, Illustrated from the (Greek) Papyri and Other Non-Literary Sources*; H. B. Walters, *A Classical Dictionary of Greek and Roman Antiquities, Biography, Geography, and Mythology*. Several well known books reached new editions: R. Heinze, *Virgils Epische Technik* (third edition); L. Whibley, *Companion to Greek Studies* (third); Meillet, *Introduction à étude comparative des langues indo-européennes* (fourth); K. Georges, *Ausführliches Lateinisch-Deutsches Handwörterbuch* (no copy of this work was accessible; it is to be hoped it is a real revision, since a new Latin dictionary is sorely needed); W. Dittenberger, *Sylogæ Inscriptionum Græcarum* (third), vol. i. The important work of Emile Boisacq, *Dictionnaire Etymologique de la langue grecque*, was completed.

**PHILOLOGY, MODERN.** The year 1916 has revealed few contributions of importance to the study of philology. As has been indicated in previous YEAR BOOKS, this is due principally to the fact that the younger generation of philologists, from whom much was to be expected, are engaged with the duties imposed by the war. Nowhere is this more strikingly exhibited than in the study of Celtic, in which such marked progress has been noted in the recent past. The leaders in research in this field hail from England, France, and Germany. Consequently nothing has appeared to indicate in any striking manner the development of these studies. The greatest loss suffered thus far by Celtic philology was by the death of Joseph Déchelette, who fell on the field of battle in Champagne in 1914. The last volume of his noteworthy *Manuel d'Archéologie préhistorique celtique et gallo-romaine*, originally mentioned in these columns for the year 1910, was fortunately left practically complete, and will therefore be issued in due time.

In neutral countries, however, scholars have directed their attention with increasing vigor to the study of philology. This is especially true of Spain, where many useful, if not epochal, works have appeared. It is of interest also to note the advent of women, particularly in Germany, into this line of research. At last the hoary-headed and spectacled professor, as we love to picture him, has encountered an unexpected rival who has made bold to attack many abstruse problems considered heretofore worthy of the more profound intellect of man alone. Though the newcomers have not as yet made their influence in any way deeply felt, we welcome their entrance into this field so long forbidden to them. The marked paucity of male students in German universities is, of course, the fundamental reason for this astonishing social change.

Before beginning to enumerate the works that have appeared during the year 1916, it behooves us to call attention to the two volumes entitled *La Science française* which arrived too late for mention in our previous review. The genesis of this compilation is due to the initiative of the founders of the library of French literature and science at the International Exposition at San Francisco. The second volume

is of especial interest to students of philology inasmuch as it contains essays of an historical character on the following subjects (the authors of which, it may be added, rank among the leading scholars of France): *Les études égyptologiques* by Gaston Maspéro; *la linguistique* by A. Meillet; *l'indianisme* by Sylvain Lévi; *la sinologie* by Ed. Chavannes; *l'hellénisme* by Alfred Croiset; *l'archéologie classique* by Maxime Collignon; *la philologie latine* by René Durand; *la philologie celtique* by Georges Dottin; *les études sur la langue française* by Alfred Jeanroy; *les études sur la littérature française du moyen âge* by the same author; *les études sur la littérature française moderne* by Gustave Lanson; *les études italiennes* by Henri Hauvette; *les études hispaniques* by Ernest Martinenche; *les études anglaises* by Emile Legouis; and *les études germaniques* by Charles Andler. It is unfortunate that the limits of space forbid even a general synopsis of these essays, for it is by means of them that we are enabled to see the immense contributions made by French scholars to these various fields of knowledge. Probably the best example of the keen foresight of Gallic scholars is shown by philology in which they began to enter only after the Germans had thoroughly broken the ground. According to the brilliant Meillet, they realized at once its possibilities, and limited themselves to facts, staunchly refusing to yield to the glamor of general—and often false—hypotheses, the bane of the past generation. Notwithstanding that there have been numerous German schools of philology, there has never been a French school for the simple reason that *savants* of that nationality have always drawn their conclusions from data, and have refrained from accepting any theory that was not entirely in accordance with facts. At the outset Frenchmen sought to approach the subject from every angle in order to bring all possible light to bear upon it. It is this above all which has prevented their works from becoming archaic so rapidly, and has at the same time led to the introduction of new fields of study, such as semantics, dialectology, phonetics, and kindred subjects. Without the initiative of the Gallic mind philology would have soon passed into a state of total inertia, if not possibly one of degeneration and decay. To quote the words of M. Meillet, "le trait essentiel et dominant est le souci de demeurer en contact étroit avec les faits. Qu'ils aient eu pour objet des langues mortes ou des langues vivantes, des langues littéraires ou des parlars populaires, les linguistes français se sont attachés, avant tout, à suivre avec souplesse la réalité dans sa complexité, dans sa variété infinie. Ils n'ont pas essayé de ramener l'histoire à un simple schéma; ils se sont efforcés de la suivre dans ses détours. S'ils ont rencontré la notion de dialecte, ils l'ont dissoute dans celle, plus réelle, de faits dialectaux, et ils se sont efforcés, par exemple, de tracer, non les limites des dialectes, mais les limites des faits dialectaux." The outcome of these methods was not only the monumental *Atlas linguistique de la France* of Gilliéron and Edmont, of which the eminent critic, Gaston Paris, said that "la science française peut légitimement s'enorgueillir," the *Sémantique* of Breal, the acute *Aires morphologiques dans les parlars de l'Angoumois* of Terracher, and the *Dissimila-*



tion *consonantique* of Grammont—a work so new and so original that it is still little understood—but also the *Histoire de la langue française* of Brunot—of which, according to M. Jeanroy, there is no equivalent at present in any other country—the great impulse given to phonetics by the researches of Abbé Rousselot, and others, the development along characteristic lines of the Celtic school, and the rehabilitation of the spoken language made by Meillet in his suggestive contributions to the study of Armenian, Slavic, and Greek. It is thus not so much by *des recherches de détail*, as by the *introduction de vues neuves et de directions originales* that philology has received new vigor from French thought.

As regards this subject, future scholars will no doubt consider ours an era of transition, characterized by a study of details and grouping of facts. This science—if so it may be called—is yet too young to have its Darwin or its Spencer. But when all possible fields shedding any light on it have been opened up, when language will be considered the corollary of the study of man in his widest relations, when, in a word, thought and its expression will be subjected to the most careful analysis, then most certainly will we be able to grasp the true import of the study of philology. Thanks mainly to the originality of the Gallic mind, philology has passed from a state of arid, and often puerile, theory to one of a more innate relation with human life in general. It remains for the future to reveal to us the significance of this evolution.

In our enumeration of philological works of value, it should not be forgotten that because of the great European upheaval many reviews have either suspended publication or only appear sporadically, while others are delayed in the mails. Hence in our review for 1915 many works that appeared toward the close of the year failed to receive due mention. As they are included in the present summary, the reader is reminded that whenever no date is given it means that the work appeared in 1916.

GENERAL. Among the most important works of a general nature are F. de Saussure's *Cours de linguistique générale*, edited by Bally and Séchehaye (Paris), and the second edition of O. Schrader's *Die Indogermanen* (Leipzig). R. de la Grasserie's *Du caractère concret de plusieurs familles linguistiques américaines* (Paris), and C. S. R. Collin's *Bibliographical Guide to Sematology* (Lund, 1915) are also general works of great value. L. Wiener's *Commentary to the Germanic Laws and Medieval Documents* (Cambridge, Mass.) is an excellent example of the dangers of uncontrolled theorizing. E. Sapir's *Time Perspective in Aboriginal American Culture* (Ottawa) is an exceedingly interesting and suggestive study in method. Useful compilations of a general nature are the *Folk-Lore, Manners and Customs, Social Groups*, issued by the Library of Congress (Washington), which treats of communities, classes, races, general works, and polygraphy; A. Hettler's *Philologenlexikon* (Halle), containing biographies and bibliographies of all the leading German philologists; and P. Schulze's *Deutsche Zeitschriften-Katalog* (Leipzig), containing about 3700 titles of articles. In the Indo-Iranian group of languages, E. W. Hopkins's *Epic Mythology*, published in the *Grundriss der indoarischen Philo-*

*ogie* (Strassburg, 1915), is probably the most important contribution. It may not be out of place to mention also A. von Ow's *Brahma-Woden: Indogermanische Zusammenhänge* (Regensburg), and D. N. Neogi's *Sacred Tales of India* (New York). A work of far-reaching importance, which has been in publication for many years, is J. Bloch's *La formation de la langue marathe*, of which the 215 fascicule has just appeared (Paris). It is devoted to one of the leading modern members of the southern group of the Indo-Aryan languages (see article MARATHI in the NEW INTERNATIONAL ENCYCLOPEDIA, vol. xv, page 61), and is an excellent specimen of rigorous and careful linguistic method. Other works lying somewhat outside of this domain, but deserving of mention are P. Abelson's *English-Yiddish Encyclopædic Dictionary* (New York, 1915), and G. Maspéro's excellent *Grammaire de la langue khmère* (Paris), devoted, as its title indicates, to Khmer, the leading dialect of Cambodia (see article CAMBODIA in N. I. E., vol. iv, page 369).

SLAVIC. Likewise in this field very little of a serious nature has been issued. A. Leskien's collection entitled *Balkanmärchen aus Albanien, Bulgarien, Serbien und Kroatien* (Jena, 1915), M. Zunković's *Slavische Runen-Denkblätter* (Kremsier, 1915), and H. Petersson's *Zur slavischen und vergleichenden Wortforschung* (Lund, 1915) may be deserving of mention. Practical works abound, even for languages which received little attention heretofore. The titles of a few of the most important are the following: Russian: M. de Valette and Olga Klionoff, *Introduction à l'étude de la langue russe* (Paris), and N. Forbes's *Russian Grammar* (Oxford). Serbian: P. Lanux and A. Onyévitch, *Grammaire de la langue serbe* (Paris), and Mlle. D. Vékovitch, *Dictionnaire français serbe* (Paris). Polish: J. F. Baluta, *Practical Handbook of the Polish Language* (New York, 1915); Legowski, *Methodische Grammatik der polnischen Sprache* (Leipzig); B. Manassewitsch, *Praktische Grammatik der polnischen Sprache* (7th ed., Vienna, 1915); Hill's *Polish-English and English-Polish Dictionary* (London), a small but very useful work; Wasikowski, *Kleines Taschenwörterbuch der deutschpolnischen und polnischdeutschen Sprache* (Berlin, 1915); and Booch-Arkossy, *Vollständiges Polnisch-Deutsches und Deutsch-Polnisches Wörterbuch* (16th ed., 2 vols., Leipzig). As for Czech or Bohemian we may mention J. Herzer's extensive *Böhmisch-deutsches Wörterbuch* (Prague) of which the 78th *heft* appeared. (For CZECH, see N. I. E., vol. vi, page 421.)

CELTIC. Among the general works intended for the layman the reader is referred to Joseph Dunn's *The Study of Celtic* which appeared in the *Catholic University Bulletin*, and J. L. Gerig's *Celtic Studies in the United States*, published in the *Columbia University Quarterly*. In Irish we have Stephen Brown's *Ireland in Fiction* (London), the purpose of which is to serve as a guide to Irish novels, tales, romances, and folklore. The best and most complete translation of the famous epic, the *Táin Bó Cúilnge*, was made by J. Dunn in 1914 (London). Since that time there has appeared an edition of the same, consisting of the text of the Yellow Book of Lecan with variant readings from the Lebor na hUidhre, begun by

the late John Strachan and completed by J. G. O'Keefe (Dublin), C. J. S. Marstrander's *Bidrag til det norske sprogs historie i Irland* (Christiania, 1915), P. Walsh's *Place-Names of West-Meath* (Dublin, 1915), and T. O'Neill Lane's *Larger English-Irish Dictionary* (ib.) are valuable as reference works. G. F. Black's *List of Works Relating to Scotland*, published by the New York Public Library, contains important sections on Gaelic language and literature (pp. 912-930). As for Welsh, we note the following works more or less closely related to that field of research: L. Mühlhausen's *Die lateinischen, romanischen, germanischen Lehnwörter des Cymrischen, besonders in Codex Venedotianus der cymrischen Gesetze* (Leipzig dissertation, 1914); G. L. Kittredge's *Study of Gawain and the Green Knight* (Cambridge, Mass.), H. O. Sommer's *Vulgate Version of the Arthurian Romances* (Washington), consisting of an index of names and places to vols. i-vii; and V. Creacini and V. Todesco, *L'Inchiesta del San Graal* (Barcelona), yet incomplete.

ENGLISH. Works of a rather general appeal are: G. A. Nicholson's *English Words with Native Roots and with Greek, Latin, and Romance Suffices* (Chicago); T. DeVries's *Holland's Influence on English Language and Literature* (Chicago); E. Weekley's *Surnames* (London); and H. Harrison's *Surnames of the United Kingdom* (London), a concise etymological dictionary, of which parts 14-16 of vol. ii were issued. The subject of place-names, to which the British and Americans began to give their attention only a few years ago, possesses at present a bibliography of considerable extent. Among the more important contributions of the year are C. E. Jackson's *Place-Names of Durham* (London); Rev. A. T. Bannister's *Place-Names of Herefordshire* (Cambridge); W. Rye's *Scandinavian Names in Norfolk* (Norwich); and the *Fourth Report of the United States Geographic Board (1890-1916)* (Washington), which contains a list of place-names in the United States with the changes in spelling recently introduced. In Anglo-Saxon the 5th edition of E. Sievers's *Abriß der angelsächsischen Grammatik* (Halle) appeared at the close of the year 1915. The publication of T. N. Toller's *Anglo-Saxon Dictionary based on the MS. Collections of the late Joseph Bosworth*, which had been interrupted for some time, was resumed (part ii, Oxford). J. R. C. Hall's *Concise Anglo-Saxon Dictionary for the Use of Students* (2nd ed., New York), was a welcome addition. Nor was Beowulf neglected. Among the contributions to this field of research in English philology are R. Wickberg's *Beowulf översatt* (Upsala, 1915), a translation into Swedish; Chr. Kier's *Beowulf, et bidrag til nordens oldhistorie* (Copenhagen, 1915); and A. J. Wyatt's *Beowulf, with the Finnsburg Fragment*, revised by R. W. Chambers (Cambridge, 1914). Syntactical questions also claimed the attention of many students. The most important works of this nature are E. Reinecke's *Der Gebrauch des bestimmten Artikels in der englischen Prosa des 16. Jahrhunderts* (Halle dissertation, 1915); M. Schröter's *Der bestimmte Artikel bei Flussnamen im Neuenglischen* (Halle diss., 1915); V. Schultz's *Das persönliche Geschlecht unpersönlicher Substantiva bei Spenser* (Kiel diss., 1914); W. Azzalino's *Die Wortstellung im King Horn* (Halle

diss., 1915); H. Kreickemeyer's *Die Wortstellung im Nebensatz des Englischen* (Giessen diss., 1915); V. Marinoff's *Die periphrastische Form des englischen Verbums in ihrer Verwendung als Intensivum in modernen Sprachgebrauch* (Halle diss., 1915); Ch. Müller's *Die englische Lautentwicklung nach Lediard (1725) und anderen Grammatikern* (Giessen diss., 1915); and A. Wuth's *Aktionsarten der Verba bei Cymquulf* (Leipzig diss., 1915). Other works deserving mention are: H. Bradley's *Numbered Selections in Old English Poetical MSS.* (Oxford, 1915); P. Feuerherd's *Geoffrey of Monmouth und das Alte Testament with respect to the Historia Britonum of Nennius* (Halle diss., 1915); Ida Geisel's *Sprache und Wortschatz der altenglischen Guthlaüberetzung* (Basle diss., 1915); K. Breul's *Goliard's Song Book of the Eleventh Century* (Cambridge, 1915); H. Tardel's *Zwei Liedstudien* (Bremen, 1915), dealing especially with the ravenballads of England and Scotland; E. Sieper's *Die altenglische Eleyie* (Strassburg, 1915); J. E. Wells's *Manual of the Writings in Middle English 1050-1400* (New Haven); and G. H. Cowling's *Dialect of Hackness (Northeast Yorkshire)* (Cambridge). Text-books of interest are: C. Noble's *Story of English Speech* (Boston); D. M. Staley's *Psychology of the Spoken Word* (ib.); and R. P. Utter's *Everyday Words and Their Uses* (New York). The Oxford English Dictionary has continued publication without interruption. The parts that were issued during the year 1916 are the following: vol. ix, *subterraneously-sullen*, by C. T. Onions (January); vol. x, *turndun-tsivrid*, by Sir J. A. H. Murray (April); vol. ix, *stead-stillatim*, by H. Bradley (July); and vol. x, *v-verificative*, by W. A. Craigie (October). The 3rd edition of *Webster's Collegiate Dictionary* (Springfield, Mass.) also made its appearance. F. J. Willstach's *Dictionary of Similes* (Boston), and F. H. Vizetelly's *Twenty-Five Thousand Words Frequently Mispronounced* (New York) should not be omitted.

DUTCH. In addition to the work of De Vries mentioned above, the only contribution that seriously concerns our field is J. van Ginneken's and W. Kea's *Handboek der nederlandsche Taal* (Nijmegen), of which the second part was issued.

SCANDINAVIAN. Besides the work of W. Rye, which has already been noted, the following general works are of interest: T. W. Arnoldson's *Parts of the Body in Older Germanic and Scandinavian* (Cambridge); Klara Stroebe's *Nordische Volksmärchen*, edited by F. von Leyen and P. Zauert (2 vols., Jena, 1915), comprising most of the well-known tales of Denmark, Sweden, and Norway; S. Nordal's *Om Olaf den helliges Saga, en kritisk Undersogelse* (Copenhagen); M. Olsen's *En Indskrift med aeldre runer fra Gjernsvik i Søndhordland* (Bergen, 1915); and F. A. Wimmer's *Collectio runologica Wimmeriana* (Copenhagen, 1915). In Icelandic we note W. A. Craigie's *The Icelandic Sagas* (New York, 1915); F. Jónsson's *Rímna-safnsamling af de aeldste islandske rimer* (Copenhagen); A. G. Brodeur's *The Prose Edda by Snorri Sturluson* (New York), an English translation; H. Hermannsson's *Icelandic Books of the 16th Century* (Ithaca); and the *Diplomatarium Islandicum (1510-1544)*, published at Reykjavik. The contributions to Norwegian philol-

ogy consist of H. Falk's *Altnordische Waffenkunde* (Christiania, 1915); C. Jensen's *Den norske Dictionarium eller Glosebog* (ib.), new ed. by T. Hannaas; M. Haegstad's *Vestnorske Maalføre fyre 1350* (ib., 1915); K. Liestol, *Norske Trollviser og Norrone Sogor* (ib., 1915); D. A. Seip's *Lydverket i Asdølmdlet* (ib., 1915), and the same author's *Grundlaget for det norske rikemaal* (ib.). The modern language is treated in Seip's *Norsk Grammatik* (4th ed., ib., 1915) and G. T. Flom's *Phonology, of the Dialect of Aurland, Norway* (Urbana, Ill., 1915). In Swedish A. Koch's *Umlaut und Brechung im Altchwedischen* (Lund), which was begun in 1911, was completed in 1916. The 21st fasciculus of A. Noreen's *Vårt Språk, Nysvensk Grammatik utförlig framställning* (ib.) was issued during the course of the year. Other works deserving mention are O. von Friesen's *Runorna i Sverige* (Upsala, 1915); O. Ostergren's *Nysvensk Ordbok* (Stockholm, 1915) of which the first fasciculus appeared; H. Alving's *Det grammatiska subjektets plats i den narrativa satsen i svenskan* (Upsala); and M. Borgström's *Svenska språkets historia* (ib.). As for Danish, H. Bertelsen's *Danske Grammatikere fra Midten af det syttende til Midten af det attende Aarhundrede* (vol. i, Copenhagen, 1915), and J. V. Lindgren's *Dansk och norsk grammatik* (2d ed., Stockholm, 1915) are the only works of importance to reach us.

GERMAN. Among the leading works dealing with the early period of the language are E. A. Kock's *Altgermanische Paradigmen* (Lund, 1915); J. Zupitza's *Einführung in das Studium des Mittelhochdeutschen* (Chemnitz); and J. Schatz's *Altbairische Grammatik* (Göttingen, 1915). Other works of a more special character are B. Dicken's *Runic and Heroic Poems of the Old Teutonic Peoples* (Cambridge); *Der Heliand*, a Saxon poem of the ninth century (Cassel, 1915); F. Saran's *Das Hildebrandslied* (Halle, 1915); M. Lexer's *Mittelhochdeutsches Taschenwörterbuch* (13th ed., Leipzig, 1915); R. Th. Christiansen's *Die finnischen und nordischen Varianten des zweiten Merseburger Spruches* (Hamina, 1915), a comparative study; M. J. Rudwin's *Der Teufel in den deutschen geistlichen Spielen des Mittelalters und der Reformationszeit* (Baltimore, 1915); and C. Koehne's *Gewerbrechtliches in deutschen Sprichwörtern* (Zürich, 1915). Of a syntactical nature are: J. E. Hägberg's *Untersuchung über die Wortstellung in Heliand* (Kemberg, 1915); M. Kleinbrückner's *Reimgebrauch Konrads von Würzburg im Engelhard* (Duppau, 1915); Dorotea Ebert's *Die Sprache des Trierer Paalters* (Marburg diss., 1915); A. Wolf's *Das Präfix uz- im gotischen und im deutschen Verbum* (Breslau diss., 1915); R. Fey's *Neuhochdeutsche Appositions-Gruppen, unter besonderer Berücksichtigung der psychologischen Verhältnisse untersucht* (Halle); O. P. Rein's *Mixed Preterites in German* (Baltimore, 1915); E. H. Sehrts's *Zur Geschichte der westgermanischen Konjunktion "Und"* (Baltimore); and T. W. Arnoldson's *Parts of the Body in Older Germanic and Scandinavian* (Cambridge). Studies of dialects are far less numerous than usual. Those deserving mention are J. Bayer's *Matthias Joseph de Noël und seine Dichtungen in kölnischer Mundart* (Cologne, 1915); R. Hörter's *Die mundartliche Kunstdichtung der Siebenbürger Sachsen* (Hermannstadt, 1915); K. Schiffmann's *Die Sta-*

*tionsnamen der Staatsbahnlilien in Oberösterreich erklärt* (Linz, 1915); and A. Halbedel's *Fränkische Studien* (Berlin, 1915). One cannot overemphasize the study of loan words because of their importance in tracing the history of a language. They not only show the foreign influences exerted upon a language, but serve to indicate also the precise period in which linguistic changes have taken place. In Germany the tendency of late has been toward this study. Among the various works dealing with loan words we may note P. Möller's *Fremdwörter aus dem Lateinischen im spätern Mittelhochdeutschen und Mittelniederdeutschen* (Giessen diss., 1915); A. Tesch's *Fremdwort und Verdeutschung* (Leipzig, 1915), a useful dictionary; O. Kresse's *Verdeutschung entbehlicher Fremdwörter* (Berlin, 1915); and T. E. Karsten's *Germanisch-Finnische Lehnwortstudien* (Helsingfors, 1915), which treats of the earliest linguistic and cultural history of the Teutons. Interesting as a chauvinistic document is A. Baumann's *Wede, die Verständigungssprache der Zentralmächte und ihrer Freunde* (Diessen, 1915), which represents an effort to create a new international language of Central Europe. An abridged edition of O. Lyon's *Handbuch der Deutschen Sprache* (Leipzig), edited by W. Scheel, also made its appearance. Two philological dictionaries deserve mention, one by H. Schmidt (2d ed., ib.) and the other by P. Thormeyer (ib.). Finally H. Barth's *Bibliographie der Schweizer Geschichte* (vol. iii, Basle, 1915) contains a good bibliography of studies touching upon the linguistic history of Switzerland (pp. 230-242).

ROMANCE. For those wishing to keep in touch with the development of this field of research the following annual bibliographies are noted: *International Index to Periodicals for 1914* (vol. xiv, Leipzig, 1915); *Kritischer Jahresbericht über die Fortschritte der romanischen Philologie*, edited by K. Vollmöller, of which the present volume (xiii) is devoted to years 1911-12 (Erlangen, 1915); and *Mitteilungen und Abhandlungen aus dem Gebiet der romanischen Philologie* (vol. iii, Hamburg, 1915). J. Th. Graesse's translation of the *Gesta Romanorum*, a popular collection of anecdotes of the later Middle Ages (see N. I. E., vol. ix, p. 713), was revised by H. Hesse (Leipzig, 1915). K. Dürre's *Die Mercatorszene im lateinischliturgischen, altdutschen und altfranzösischen religiösen Drama* (Göttingen diss., 1915) is of value for the student of religious drama.

FRENCH. The second fasciculus of A. Tobler's *Altfranzösisches Wörterbuch*, edited by E. Lommatzsch, which includes *aber-aima*, appeared at the close of the year 1915 (Berlin). In Old French we note the following works: C. Appel's edition of *Bernart von Ventadorn, Seine Lieder* (Halle, 1915), containing an introduction and glossary; H. Breuer's edition of *Cristal et Clarie*, a romance of adventure of the thirteenth century (ib., 1915); H. d'Andeli's *Battle of the Seven Arts*, a French poem of the thirteenth century, edited and translated by L. T. Paetow (Berkeley, Cal.); S. Scheler's *Sitten und Bildung der französischen Geistlichkeit nach den Briefen Stephans von Tournai*, an author of the twelfth century (Jena diss., 1915); K. Simon's *Die Chanson de Renaud de Montauban* (Griesswald diss., 1915); and J. Orr's *Les Œuvres de Guicot de Provins* (London). Dealing with syn-

tax and other technical questions are B. F. Luker's *Use of the Infinitive Instead of a Finite Verb in French* (Columbia diss., New York); E. Stimming's *Der Accusativus cum Infinitivo im Französischen* (Halle, 1915); S. Merian's *Die französischen Namen des Regenbogens* (Basle diss.); H. Rotzler's *Die Benennungen der Milchstrasse im Französischen* (Basle diss.); and R. Klein's *Die Wortstellung im Französischen* (Leipzig, 1915). In dialectology we have L. Gauchat's valuable *La Trilogie de la Vie: articles-spécimens du Glossaire des Patois de la Suisse romande* (Lausanne); and E. Labadie's *Catalogue d'une collection de plus de 500 ouvrages en patois gascon et languedocien faisant partie de la bibliothèque de l'auteur*, with a preface by E. Bourciez, a mine of information (Bordeaux). While not belonging precisely to our field the *Manuel de numismatique française* (Paris) of A. Blanchat and A. Dieudonné is too important to be overlooked. A few grammars of the modern language are Fischer-Dedet's and Bauer's *Grammaire française* (Paris, 1915); A. Prévost's and J. Laurent's *Cours de langue française* (ib., 1915); and H. E. Berthon's *Première grammaire française* (New York). Useful language manuals are *The Soldier's Language Manual* by Ajax, for English and French (6th ed., London, 1915); and Plumon's *Guide français-anglais* (Paris, 1915), containing lists of technical terms and locutions. In the list of dictionaries for general use we note J. Guérin's and G. Bovier-Lapierre's *Nouveau dictionnaire universel illustré* (Tours); W. James's and A. Molé's *Dictionary of the French and English Languages* (new ed., New York); J. Bellows's *Dictionary of French and English*, revised by W. Bellows (London); *Dictionnaire des termes militaires et de l'argot poilu* (Paris); J. Saulnier's *Petit dictionnaire orthographique de poche* (Bordeaux); and Faustina de Graziani's *Dictionnaire italien-français* (Paris). L. Sainéan's *L'Argot des tranchées* (ib., 1915) is an interesting study of a rapidly growing colloquial speech. H. P. Thière's *Essai sur l'histoire du vers français*, with a preface by Gustave Lanson (ib.), is one of the important works of the year. The publication of Lorenz's *Catalogue générale de la Librairie française* is being resumed (vols. xxiv and xxv, fasc. 1, ib., 1915).

ITALIAN. (On the early literature of Italy the only work to be noted is R. Palmieri's *Studi di lirica toscana anteriore a Dante* (Florence). There are, however, many additions to the list of studies of the numerous and varied Italian dialects which heretofore have unfortunately received little attention. G. Bertoni's *Italia dialettale* (Milan) is the best general work on the subject. Other works extending over vast periods of linguistic history are L. Frati's *Rimatori bolognesi del trecento* (Bologna, 1915); *Chartularium Studii Bononiensis, documenti per la storia dell'Università di Bologna della origini fino al secolo xv* (vol. iii, ib.); G. Zaccagnini's and A. Parducci's *Rimatori Siculo-Toscani del dugento* (Bari, 1915), including those of Pistoia, Lucca, and Pisa; A. Leotti's *L'Albanese parlato* (Milan), with vocabularies, proverbs, and locutions; G. Malagoli's *La Letteratura vernacola pisana posteriore al Fucini* (Pisa, 1915), with notes and glossary; A. Trauzzi's *Arte e limiti linguistici nella dialettologia italiana moderna* (Rocca San Casciano); and G. Piccio's *Dizionario veneziano-italiano* (Venice).

G. L. Passerini's *Vocabolario Carducciano* reappears with two appendices containing vocabularies to D'Annunzio and Pascoli. A. Paviolo's *Il Vocabolario amministrativo* (Cuneo) and J. Gelli's *Divise, moti, imprese di famiglie e di personaggi italiani* (Milan) are of more interest to the Italian than to the foreigner. N. Tommaseo's *Dizionario della lingua italiana*, edited by G. Biagi (Turin), and O. Pierini's *Lingua italiana* (Bologna) are intended for native students.

SPANISH. J. A. Coelho's *As Nacionalidades ibéricas* (Lisbon, 1914) deals with the history of the Iberians in Central and Southern Spain and Portugal. L. Pfandl's *Beiträge zur spanischen und provenzalischen Literatur- und Kulturgeschichte* (Bayreuth, 1915) treats of the Middle Ages. A. Castro's and F. de Onis's *Fueros leoneses de Zamora, Salamanca, Ledesma y Alba de Tormes* (Madrid) is of interest for the history of the ancient dialects of those regions. Other dialect studies are P. de Zamaripa y Uraga's *Gramática vascóngada* (Bilbao, 1915); Ll. Fullana Mira's *Gramática elemental de la llengua valenciana* (Valencia, 1915); J. de Llamano y Beneite's *El dialecto vulgar de Salamanca* (Salamanca, 1915); A. Bastafias's *Galicismos, barbarismos, hispanismos* (Madrid, 1915); and M. de Toro y Gisbert's *Americanismos* (Paris, 1915). The fourth volume of Cejador y Frauca's *Historia de la lengua y literatura castellana*, dealing with the period of Philip III has just appeared (Madrid). The third volume of F. Pinochet-Le-Brun's *Crestomatía española* is devoted to the literature of the pre-classical period (Santiago, Chile, 1915). C. C. Marden's *Critical Edition of the Spanish Apollonio* (Baltimore) and F. M. Pabano's *Historia y costumbres de los gitanos* (Barcelona, 1915) are of interest to specialists. Useful bibliographical works are P. Goldsmith's *Brief Bibliography of Books in English, Spanish, and Portuguese relating to the Republics Commonly Called Latin American* (New York, 1915), and W. Hanssler's *Handy Bibliographical Guide to the Study of the Spanish Language and Literature* (St. Louis, Mo., 1915). Two works of value to the foreigner are R. Blanco Sánchez's *Tratado elemental de la lengua castellana* (6th ed., Madrid, 1915) and the *Repertorio de palabras usuales castellanas de sentido análogo, semejante o apropiado* (Barcelona).

CATALAN. The first three parts of the valuable *Diccionari Aguiló* appeared during the year at Barcelona. Excellent collections of texts are also being issued. Those of note are R. d'Alós's *Crestomatía catalana* (ib.); P. Barnils's *Textes catalans avec leur transcription phonétique* (ib.); and J. Arteaga Pereira's *Textes catalans* (ib.). Other works relating to this little studied language are F. Martorell's *Recull de Documents de l'epoca comtal* (ib.); M. de Montoliu's *La Llengua en la Crònica del rei En Jaume* (ib.); P. Barnils's *Problemes fonològics del Català* (ib.); and the same author's *Revisió de fonètica catalana* (ib.). Useful vocabularies are F. Barjau's *Diccionari hebreu-llatí-català* (ib.); *Diccionari manual llatí-català* (ib.); P. Barnils's *Vocabulari català-alemany de l'any 1502* (ib.); and the *Vocabulari ortogràfic de la llengua catalana* (ib.) published by the Institut d'Estudis catalans.

OTHER ROMANCE LANGUAGES. In Provençal the only work to appear is the *Armana prou-*

vençau (Angin), which is of little interest to us. In Portuguese, Th. Braga, former president of the republic, has just issued the third volume of his *Historia da Litteratura portugueza* (Porto), which treats of the sixteenth century. A good manual is G. Eilers's *O Brasileiro, Lehr- und Lesebuch der portugiesischen Sprache* (Heidelberg, 1915). In Rhaeto-Romance there appeared A. Velleman's *L'Aggettiv e il pronom nella lingua ladina d'Engiadin Ota* (Zurich, 1915); and C. Decurtins's *Rätoromanische Chrestomathie* (vol. x, part 2, Erlangen). And lastly in Rumanian we have O. Densusianu's *Gratul din Tara Hategului* (Bucharest).

**PHONETICS.** Few works of importance were issued during the year. Among the studies of a general nature the 10th edition of W. Viëtor's *Kleine Phonetik des Deutschen, Englischen und Französischen* (Leipzig, 1915) is probably the most noteworthy. G. Noël-Armfield's *General Phonetics* (Cambridge, 1915) is intended for missionaries and students of languages. In English phonetics we note C. M. Rice's *Short English Poems for Repetition* (Cambridge, 1915), with phonetic transcript; and W. Thomson's *Laus of Speech-Rhythm* (Glasgow). In German, W. Viëtor's *Deutsches Aussprachewörterbuch* (2d ed., Leipzig, 1915). In French, M. Grammont's *Traité pratique de prononciation française* (Paris); F. Beyer's *Französische Phonetik für Lehrer und Studierende* (4th ed., Cöthen); Chabert's and Labernadie's *Les vices de prononciation et leur correction* (Paris); and G. Bonnard's *Elementary Grammar of Colloquial French on a Phonetic Basis* (Cambridge, 1915). G. de Gregorio's *La riforma ortografica dell'inglese, del francese e dell'italiano* (Palermo, 1915), and M. G. Revilla's and A. Quijano's *Un dictamen sobre la ortografia fonética* (Mexico) may also be mentioned.

**PHILOSOPHY.** The war, in our day, has performed for philosophy much the same service which Cicero ascribes to Socrates, in his day, bringing her down from the heavens and introducing her familiarly into the houses and affairs of men. A glance at the titles, whether in periodicals or book lists, is sufficient to show that in 1916 the speculative mind of Europe and America has had small leisure for the remote and transcendental; in events such as now move the world human conduct is the engrossing interest, and while this interest frequently and necessarily leads to surveys of nature beyond the sphere of human nature, yet these surveys are mainly brief excursions, turning speedily back to the world beneath the moon and the political and religious gropings of human kind. The cold "tough-mindedness" of nation-builders is reacting in philosophy to produce its antipathetic "tenderness"—which means, after all, but that men desire reason only for what they love.

Political philosophizing is the prerogative of all the world. In ordinary times, when states are smooth-running, the prerogative is exercised mainly by the chair; but in times such as the present, when all human institutions seem caught up in the winds of limbo, men of every persuasion criticise, theorize, and utopianize. Along with the professional philosophers come jurists, diplomatists, clergymen, literati, and even mathematicians, proclaiming ills and crying cures; so that it is impossible to show any clear margin between the political theorizing of philosophers and the political philosophizing of theorists.

The most that the reviewer, attached to the philosophical side, can do, is to indicate what portion of the work falls from the pens of the philosophic profession, with the open understanding that this is but an arbitrary fraction of the whole.

There are few names important in philosophy—at least in the neutral and Allied countries—that are not represented in the year's expression; and among them all none more affectingly than Josiah Royce (q.v.), whose death, September 14th, deprives us of a striking personality as well as a profound thinker. Few speeches, in a year of speech-making, have been so moving as the address which Professor Royce delivered at Tremont Temple, Boston, at the very beginning of the year, January 30th, on "The Duties of Americans in the Present War"—an address widely circulated in pamphlet form; and there is a certain dramatic propriety in the fact that one of the late books of the year should be a collection of essays voicing the fine and eloquent social idealism for which the author had so earnestly lived and so stoutly fought; indeed, Royce's *The Hope of the Great Community* (New York) strikingly recalls the last work of the greatest of ancient idealists, for Plato, too, amid the contentions of nations, turned from dialectic to create the *Laws*, that his fellow citizens might live the more nobly.

Dramatic interest attaches also to the *Justice in War-Time* (Chicago) of the Hon. Bertrand Russell—a plea for chivalrous generosity and a clear-headed righteousness in the hour of war. It was announced in the spring of the year that Mr. Russell would lecture on logic and ethics at Harvard, beginning with the fall term; but he was convicted in England under the "defense of the realm" act and passports were refused him. J. Mark Baldwin, who has been a notable pleader for the Allies, delivered the Herbert Spencer lecture at Oxford University, March 15th, on "The Super-State and the 'Eternal Values,'" the main point of which is that in the German view the nation is instrumental to the state, while the democratic view is that the state is rather the instrument. The address is reprinted as a pamphlet (Oxford). Emile Boutroux's *Philosophy and War* (translation, London) is a similar contrast of German ideals with the more distinct personalism of French and west European thought. Baron Friedrich von Hügel's *The German Soul* (London) contains two essays, or studies, one on "Christianity in face of War," the other on "The German Soul and the Great War," in the latter showing from a more intimate angle the root of the contrast which all writers feel between Germany and the West: "Weltanschauung" is at the root of the German's conception of "Weltpolitik" and his place in it. Of especial interest, as treating the war from a scientific rather than from the moral angle, is Gustave Le Bon's *The Psychology of the Great War* (New York). George Santayana's *Egotism in German Philosophy* (New York) and John Dewey's *Democracy and Education* (New York) are perhaps the most significant books, in the political relation, yet to mention from American philosophers—although Professor Dewey's work is directed not primarily to statecraft, but to statecraft through education. More remote from the present crisis than most of the foregoing, but still with the theory of the state at heart are Frederick J. E. Woodbridge,

*The Purpose of History* (New York), and David G. Ritchie, *Natural Rights* (London).

Only less striking than the turn toward political theorizing is the activity of philosophic thought in the field of religion—for in a generation marked by the destruction of so many and so great material goods it is natural for men to seek in the spiritual world a satisfying faith. Books in this field might be divided into several classes. There are first, the frankly theological and devotional works on Christianity, and with these might go some borderland books, partly in the philosophic mode. Such titles as Brother Chrysostom, *The Development of Personality* (Philadelphia), Jas. R. Cameron, *The Renaissance of Jesus* (London), J. N. Shearman, *The Natural Theology of Evolution* (London)—the latter adapting Paley's argument to modern theories of evolution—illustrate the variety of the class. There are, again, books drawing their inspiration from the philosophy of Bergson, which seem to form a class by themselves and which surely have more of the "inspirational" than of the rational elements of Bergsonism at their foundation. Horace J. Bridges, *The Religion of Experience* (New York), Lucius H. Miller, *Bergson and Religion* (New York), are examples of the better type; though it should be stated that Bergsonian literature is too prolix and various to be easily characterized, ranging all the way from criticism, as G. W. Cunningham, *A Study in the Philosophy of Bergson* (London), to whimsically imitative titles of unimportant books—*Creative Involution*, *The Creative Will*, are instances. In a third group belong books treating of non-Christian religions, chiefly Indian. The aroused interest in the East and its thought is certainly reflected in the number of books, scholarly or enthusiast, on Oriental religion. R. W. Frazer, *Indian Thought Past and Present* (late 1916, London), is a survey of the field; other books are, "Sister Nivedita" (Margaret E. Noble), *Religion and Dharma* (London); Jagmanderlal Jaini, *Outlines of Jainism* (Cambridge University); K. J. Saunders, *The Story of Buddhism* (Oxford); Frederick G. Henke, *The Philosophy of Wang Yang-Ming* (Chicago). A fourth type of interest is represented by comparative and other studies of religion and religious philosophy. Louis H. Jordan, *Comparative Religion: its Adjuncts and Allies* (Oxford), Clement C. J. Webb, *Group Theories of Religion and the Religion of the Individual* (London), and Durant Drake, *Problems of Religion* (Boston), are significant examples. Such purely scholarly books as C. H. Moore's *The Religious Thought of the Greeks from Homer to the Triumph of Christianity* (Harvard Press), and Isaac Husik's *A History of Mediæval Jewish Philosophy* (New York), are primarily of importance to the historian of philosophy, and it need hardly be added that both cover fields for which comprehensive treatments have been a decided desideratum. Clement C. J. Webb's studies of the Mediæval Schoolmen, *Studies in the History of Natural Theology* (Oxford), belongs in the same class. Not primarily the work of philosophers, but certainly of interest to all students of the growth of human thought is the series on *The Mythology of All Races* (Boston), of which three volumes have appeared during the year: *Greek and Roman*, by William Sherwood Fox; *Oceanic*, by Roland Burrage Dixon; and *North American*, by Hart-

ley Burr Alexander. The series is to comprise thirteen volumes, under the general editorship of Louis H. Gray and George Foot Moore.

But while political and religious speculations have occupied the foreground during the year, it must not be assumed that the more rigorous and "tough-minded" realm of pure abstraction has been altogether neglected. One of the interesting and indeed touching experiences of the year is to take up a copy, say, of the *Revue de Métaphysique et de Morale*, and find it devoted wholly to logical and abstruse discussions, with no hint of near catastrophe. It is quite probable, in fact, that the same need which leads some minds to seek in religious thought escape from disappointment with humanity leads others, quite as inevitably, to the dry impersonality of precise logic and the high sphere of the supralunar. Striking, too, is the predominance of methodological over constructive thinking: the mathematical certitudes of form rather than the temerity of cosmic adventure appeal to a day and generation when men are too intimately neighbored to passion to feel much confidence in their powers of perspective. After the logical interest, manifested widely in the periodicals, the resurgence of pragmatism is the conspicuous fact; for, on the book side at least, 1916 has been a pragmatic year. Doubtless the most noticed book is John Dewey's *Essays in Experimental Logic* (Chicago), the nucleus of which is Professor Dewey's contribution to *Studies in Logical Theory*, now out of print. John E. Boodin, *A Realistic Universe* (New York), is a further elucidation of this author's "pragmatic realism"—in which phrase the stress belongs on the adjective—and is an effort at a thorough philosophic synthesis, rigorously metaphysical. The English translation of Emile Boutroux's pragmatic interpretation of natural law, *The Contingency of the Laws of Nature* (Chicago), deserves note in this connection; while there is surely some pragmatic implication in the very title of Cassius J. Keyser, *The Human Worth of Rigorous Thinking* (New York). The year has brought us also the interesting promise of a protagonistic volume of pragmatic essays in answer to the similar pronouncement issued a few years since by the Neo-Realists. It must not be assumed that the latter group is quiescent: while the Western Philosophical Association has devoted most of its attention to the philosophy of the state, the National Association is still in the hands of the Realists, hammering away at the old problem of "mental," or "psychical," versus "physical" entities.

Of over-seas books, from the Continent, there has been almost an entire dearth. Books and periodicals alike published in the Teutonic nations have been held up by the blockade; Belgian publications were cut short two years ago; while in all the belligerent countries the business of thinking has necessarily been subordinated to the all-engrossing business of fighting. Indeed, one could hardly imagine a less opportune period for publishing an abstruse book. The wonder is that the periodicals from the Latin countries hold out so well as they do. Many have ceased to come, but such recognized and capable journals as the *Revue Philosophique*, the *Revue de Métaphysique et de Morale*, the *Rivista di Filosofia*, regularly appear—thinned and diminished in form, but resolutely austere and philosophical in tone. Little things show the pres-

sure of the times. The *Revue de Métaphysique et de Morale* publishes on its cover the announcement that the supplement devoted to reviews is discontinued "owing to the small number of publications concerning philosophy." *Scientia*, which is polyglot and formerly had numerous contributions in German, now publishes only in English, French, and Italian. But for all this the feeling for philosophy and the philosophical tradition is only quiescent *outré-mer*. It is a fine thing to see the *Revue de Métaphysique et de Morale* devoting its initial number of the year to the bicentenary of the death of Malebranche, and to see on its page of contents many of the most eminent names in French philosophy. In our own country *The Monist* devotes an issue to the bicentenary of Leibnitz's death—and one cannot but reflect that to these two philosophers, the Frenchman Malebranche and the German Leibnitz, so closely related in philosophical inspiration, both France and Germany owe a common debt. Two other special issues mark the periodical world. The last issue of the year of *The Journal of Philosophy, Psychology and Scientific Method* is devoted to the memory and works of Charles Sanders Peirce; while for its May number *The Philosophical Review* published a volume comprising the "Papers in Honor of Josiah Royce on his Sixtieth Birthday." Certainly it is a matter of gratification that this honor fell in Professor Royce's lifetime. Two new publications have made their appearance in the United States during the year.

On the side of necrology the year has been serious. The death of Josiah Royce (q.v.) in September deprived Harvard of its most eminent teacher and America of an international figure in philosophy. Another deprivation for Harvard came with the sudden death of Hugo Münsterberg (q.v.), who fell from his chair just after completing a lecture to his Radcliffe class on December 16th and died a few minutes later. Professor Münsterberg was but in his 54th year and was seemingly in the fullness of his powers. Since the outbreak of the war he had been an active defender of the cause of the Central Powers, and it is altogether possible that the strain of the international conflict hastened his death. To a similar cause, in part at least, is assigned the death on June 16th of Victor Delbos (1862–1916), almost of an age with Münsterberg. He was seized with an acute illness, and, says the *Revue de Métaphysique et de Morale*, "when the malady came, his organism was exhausted by the anguish of evil days and the grief of seeing death strike down with repeated blows his most beloved pupils." Delbos was one of the most beloved of the teachers in the University of Paris. His work in philosophy had been chiefly the exposition of the German idealists, especially Kant, but in the midst of the bloody conflict he could no longer endure to read his familiar authors and had turned for consolation to the study of French philosophy. It is a curious irony that Germany should thus count among her French victims perhaps the greatest contemporary disciple of Kant.

December 31st was marked by the death of George H. Howison (q.v.), who began his work as a teacher of philosophy in the Massachusetts Institute of Technology, while its culmination lay in the long period of his activity at the University of California from 1884 onward. Professor Howison was one of the few remain-

ing of the band of men who gave eminence to American philosophy in the latter part of the nineteenth century, changing the color of its thought and the form of its method from those of theology to those of science. His death marks the end of a year which, in all likelihood, future historians will regard as the close of an epoch not only in the speculative thought of America, but in that of the whole world. See also ITALIAN LITERATURE.

**PHONETICS.** See PHILOLOGY, MODERN, *Phonetics*.

**PHOSPHATE.** The phosphate rock marketed in the States in 1915 amounted to 1,335,667 long tons, valued at \$5,513,449, compared with 2,734,043 long tons, valued at \$9,608,041 in 1914, a decrease of nearly 33½ per cent in quantity, and nearly 44 per cent in value. The disproportionate decrease in value was produced by the fall in the average price per ton. The phosphate rock industry during 1915 was in poor condition, especially in Florida. Shortly after the outbreak of the war in Europe the phosphate mining companies of Florida either curtailed production very materially, or suspended mining altogether. Shipments of phosphate rock to Germany, which hitherto had been a large consumer, had almost entirely ceased, and those to other European countries had been seriously interrupted. Business was greatly retarded during the year by the lack of steamers, and by increased freight rates. The great demand for sulphuric acid, especially toward the end of 1915, was also a factor in reducing the production of domestic phosphate rock. Prices for acid ranged so high that the manufacture of acid phosphate declined. The phosphate rock mined in the United States comes from Florida, South Carolina, Tennessee, and small quantities from certain of the Western States. Florida produces by far the largest quantity. The production of 1915 was 1,358,611 long tons, valued at \$3,762,239, or 74 per cent of all the phosphate rock produced in the United States. The production in Tennessee in 1915 was 309,759 long tons, valued at \$1,327,747. This was a decrease of about 20 per cent over the production of 1914. There were imported to the United States in 1915, 72,848 tons of fertilizer, valued at \$1,535,860. See FERTILIZERS.

**PHOSPHORIC ACID.** See FERTILIZERS.

**PHOTOELECTRIC EFFECT.** See PHYSICS.

**PHOTOGRAPHY.** Developments of the year in photography were neither numerous nor startling. There was steady improvement in the usefulness and efficiency of cameras, especially since war conditions encouraged the greater perfection of these devices by domestic manufacturers. Many ingenious applications of photography were recorded which, while showing new uses of photographic art, yet involved no particularly new idea in the cameras or films. The demands for readily portable photographic devices for military use were met by the construction of several new types for aeronautic purposes. Others for use by naturalists in the photography of birds and other wild game were brought to a high state of perfection, and highly artistic results were secured by them. Not the least noticeable feature of the year was the steady improvement in the quality of pictures submitted by amateurs in many newspaper and other competitive contests. Researches in the realm of color photography were prosecuted with great

interest by many investigators, and at least one manufacturer of cameras and photographic supplies placed on the market a highly satisfactory equipment to enable amateurs to make colored photographs. Some interesting results were secured in textile manufactures in the successful color printing of fabrics by means of the three-color photographic process, and while the difficulties incidental to correct registration of the three sets of plates were apparently very great, they were not considered to be insurmountable, and it was confidently expected that this process would be much more widely used in the near future.

As had been done with moving picture photography as mentioned in the 1915 YEAR BOOK, results of constantly increasing excellence were obtained in under-water photography, employing a simple camera. Although attention is more commonly directed to the use of the moving picture camera in glass chambers under water, yet a great deal of good work has been done, and in many cases with more satisfactory results, particularly in the study of submarine flora, with the ordinary camera.

The year was unusually devoid of any important decisions in cases in litigation. While several cases of general interest were still in the courts, no decisions of an important nature had been rendered at the close of the year.

Manufacturers of cameras in the United States were striving to improve the quality of glass employed for lenses, since war conditions, by cutting off the European supply of such materials, had made a serious shortage that it was difficult to meet. Both amateurs and professionals were largely affected by the great increase in the market price of all photographic materials for this same reason, added to which the availability of many manufacturing plants for producing chemicals other than those used in photography served to make it increasingly difficult to obtain supplies in reliable quantities. In medical and surgical work the improved results in radiographic examination were due quite as much to improvements in the plates sensitized for this purpose as to the better construction of X-ray tubes. In this connection a much faster plate was used by leading radiologists so as to obtain a clear picture with a minimum time of exposure, and consequently decreased inconvenience to the patient.

It was noticeable that amateurs were making a constantly wider use of devices, such as ray screens or filters, to enable them to obtain more correct color values, especially in landscape work. Some of the portrait work done by amateurs was also regarded as being of the highest class and well worthy of mention. See ASTRONOMY; CHEMISTRY, INDUSTRIAL.

**PHOTOMETRY.** See PHYSICS.

**PHOTO-PLAYS.** See MOVING PICTURES.

**PHYSICAL CHEMISTRY.** See CHEMISTRY, GENERAL.

**PHYSICS.** The increasing demands of the war were felt in the domain of physics very keenly and one of the net results was that the published work of German and English physicists was relatively of less importance in 1916 than in previous years. The large amount of work published in the United States was due not alone to the increased activities of American universities and the many valuable contributions from the National Bureau of Stand-

ards. Research laboratories connected with industrial organizations such as the General Electric Company, the National Electric Lamp Association, or the United Gas Improvement Company carried on very important investigations. Naturally most of this industrial scientific research was directly prompted by some commercial need. At the same time, the men carrying on these researches were among the best trained of American scientific investigators. The chief difference between the work at these laboratories and that carried on at the universities often seemed to be that in the former case the investigator had larger facilities. On the other hand, one of the most enthusiastic and prolific groups of workers consists of Prof. R. A. Millikan and his associates and students. Their work will be discussed in some detail in later paragraphs.

**THEORETICAL PHYSICS.** It is difficult to scan a single number of any of the standard periodicals dealing with physics without finding at least one article on some phase of the *Quantum Theory*. A general outline of this was given several years ago in earlier YEAR BOOKS (1910, 1911, and 1912), and more than one reference occurs in this article. As originally stated by Planck, the *quantum theory* was based on certain assumptions, some of which at least seem questionable, and many attempts have been made to give it a (seemingly) more sound theoretical basis. Such papers cannot be reviewed in brief, and a mere enumeration of authors and titles for 1916 would be without purpose here. A similar remark applies to the contributions on *relativity theory*. Further reference to *quantum theory* will be found in connection with the discussions of *Photoelectric Effect* and of *X-Rays*. The remarkable agreement of the values for "h" deduced by Millikan from measurements on the photoelectric effect and by D. L. Webster from X-ray data should be noted.

**PHYSICAL PHOTOMETRY.** The task of increasing the accuracy of our knowledge of some physical constant or of improving a method of measurement may be very important, but it hardly appeals to the imagination as does research in newer fields. But the results of the increasing demands of modern illumination for the perfecting of the *art* of accurate photometry furnished an excellent illustration of the way in which commercial research—so called—often leads to valuable results of general scientific interest. To make photometry exact two primary requirements have to be met: First, an accurately reproducible standard "lamp" must be designed. Second, the errors due to individual judgment, defects in the eye, fatigue, etc., of the person making the photometric comparison must be eliminated.

To meet the first of these needs much work had been done on light sources and on the "mechanical equivalent of light." This in turn led to detailed studies of the relation between the *luminous* energy given off by a *black body* and its temperature. It is unnecessary here to enumerate in detail the work of the individual investigators. Ives, Kingsbury, Karrer, Langmuir, Foote, and Fairchild were among those who contributed in this field.

The second requirement has introduced many interesting questions. It has been necessary to determine just what effect is produced on the average eye by the luminous energy from a given



source. This problem has its physiological and psychological as well as its physical aspects, many of the errors in photometry lying outside the domain of physics. The difficulties were largely overcome by the work of Ives and his associates. Two or three years previously they had succeeded in giving a satisfactorily exact definition to what might be called an "average eye." That is, by averaging the results obtained by a number of carefully chosen observers they obtained an accurate measure of the luminous value to be assigned to energy of each wave-length (color) throughout the visible spectrum. This luminous value is *not* proportional to the total amount of energy of that wave-length. The next step, therefore, was to devise suitable filters to transmit the *energy* of a given wave-length in exact proportion to its *luminous* value. The problem of photometric comparison is then reduced to comparing the total amounts of "filtered" energy from the two light sources. This makes it possible to substitute for the eye some form of energy-measuring instrument, such as the thermopile or the photoelectric cell, thus eliminating the physiological and psychological difficulties.

It must not be assumed that this summary is confined to the results obtained in 1916, or that these have been discussed in strictly chronological order. For example, the investigations on the average eye and luminous values were essential to some of the work on black body sources. However, this seems to be a fitting time to summarize the progress made thus far. More than a score of papers dealing with this work appeared during the year 1916 and a satisfactory solution of the original problem seemed close at hand. Fortunately this does not mean that all the problems suggested by the investigations had been solved, for more than one apparently minor investigation had proved unexpectedly fruitful. The 1916 volumes of the *Physical Review* and the *Journal of the Franklin Institute* should be consulted for further details.

**RADIATION LAWS AND HEAT.** The exact numerical values of the several constants occurring in the equations giving the laws of black body radiation are of importance for reasons aside from the work on photometry. The revolutionary conclusions to which the *quantum theory* leads emphasize the importance of verifying it quantitatively in every way possible. For these calculations, accurate values of the radiation constants are absolutely essential. The growing importance of *accurate* optical pyrometry makes similar demands. For a number of years Coblentz, of the Bureau of Standards, had been studying problems connected with radiation, and during the year published revised values for several of these constants. (*Bulletin Bur. of Stds.*, vol. xii, pp. 503-551, 553-582; vol. xiii, pp. 459-477, 1916—*Scientific Papers*, 261, 262, and 284.) Needless to say, this work represents experimental investigation of the highest order. To appreciate the painstaking attention to detail which is involved, the original papers must be consulted. Measurements on the constant of the Stefan-Boltzmann law in the range 20°C. to 450°C., in substantial agreement with Coblentz, were published by Gerlach. (*Ann. d. Physik*, 50, 3, pp. 233-269, 1916.)

About the middle of 1915, R. W. Wood described a series of ingenious experiments on what

he called a "one-dimensional gas." As is often the case with Wood's striking experiments, the apparatus itself was very simple, consisting of a long, narrow glass tube with a constriction at one end, beyond which a bulb was blown. The other end terminated in a small bulb, at an angle to the tube, into which a drop of mercury was sealed. The apparatus was suitably exhausted. When the mercury was heated gently and the remainder of the apparatus was suitably cooled in liquid air, the narrow stream of mercury vapor which penetrated the bulb at the other end consisted of molecules all of which were moving in the same direction. To such a stream of molecules it is obvious that many conceptions of the kinetic theory of gases do not apply. The original purpose of the experiments was to study the law of reflection of the molecules, and Wood concluded that when reflected from polished glass, the distribution followed the cosine law. Later experiments by Wood on cadmium vapor and by Knudsen on mercury vapor showed that the temperature of the reflecting surface exerts a marked influence on the whole phenomenon. For example, if a stream of mercury molecules falls on a glass surface at a temperature of  $-130^{\circ}$  to  $-140^{\circ}$  C. or lower, none will be reflected; if the surface is slightly above this temperature they will be reflected according to the cosine law. (*Phil. Mag.* 30 pp. 300-304, 1915; 32 pp. 364-371, 1916. *Ann. d. Physik* 50, 4, pp. 472-488, 1916.)

Langmuir criticised Wood's interpretation of the phenomena observed. In a very careful and exhaustive article (*Phys. Rev.*, pp. 149-176, Aug., 1916), he advanced the explanation that the molecules *always* condense upon striking the surface. If the surface is at a sufficiently high temperature they then reevaporate at a rate depending only upon the temperature and the degree of exhaustion of the bulb.

**PHOTOELECTRIC EFFECT.** The application of photoelectric cells in physical photometry has already been mentioned. A very sensitive and satisfactory form of cell for photometric work on the stars was developed by Kunz and Stebbins. (*Phys. Rev.* 7, pp. 62-65, 1916.) Some years before (see 1911 YEAR BOOK) Pohl and Pringsheim called attention to two classes of photoelectric effect in the case of the alkali metals—the "normal" and the "selective" effects. The selective effect is produced by light of certain wave-lengths polarised in the plane of incidence, and they suggested that there was a radical difference in the respective mechanisms involved. This was later questioned by A. L. Hughes. He found that in a sodium-potassium alloy the number of electrons emitted in the selective effect was approximately 26 times the number in the normal effect, but the ways in which they were emitted were practically the same and there was no evidence of any fundamental difference in the mechanisms involved.

In studying lithium, sodium, and potassium, Souder obtained results which suggest the *selective* effect, although the conditions were such that, according to Pohl and Pringsheim, the *normal* effect was to be expected. This may be due to the fact that the surfaces used were cut with a razor edge in vacuo, thus giving a mirror-like surface.

One of the causes for the discordant results obtained by different observers was suggested by

the work of Piersol. In the case of palladium, platinum, gold, nickel, and silver he found that repeated heatings are necessary to drive off the occluded gases. This was accompanied by an increase in the photoelectric sensitiveness. Robinson, in studying thin films of platinum, found that films whose thickness is approximately  $10^{-7}$  cm.—about one twenty-five millionth of an inch—are especially sensitive.

The work of Millikan and his associates has been mentioned. It is no exaggeration to say that Millikan's two papers on "Einstein's Photoelectric Equation and Contact E.M.F." and "The Direct Photoelectric Determination of Planck's 'h'" (*Phys. Rev.* 7, pp. 18-32, Jan., and pp. 355-388, Mar., 1916) were among the most notable contributions of recent years. The second paper is really a continuation of the first. The experimental work demanded great skill and ingenuity, and the theoretical interpretation of the results is most illuminating. The apparatus has been aptly described as a "machine shop in vacuo." It made possible "The removal in vacuo of all surface films from all surfaces; the measurement of the photo currents and photo potentials due to these film free surfaces; the simultaneous measurement of the contact e.m.f.'s of the surfaces." No adequate review of the experimental details nor of the theoretical arguments is possible within brief limits. The following excerpts—the first two sentences of the first article and the last two sentences of the second—are suggestive, but the original articles should by all means be consulted:

"Einstein's photoelectric equation for the maximum energy of emission of a negative electron under the influence of ultra-violet light, namely

$$\frac{1}{2}mv^2 = Ve = h\nu - p^*$$

cannot in my judgment be looked upon at present as resting upon any sort of satisfactory theoretical foundation. Its credentials are thus far empirical, but it is an equation which, if correct, is certainly destined to play a scarcely less important rôle in the future development of the relations between radiant electromagnetic energy and thermal energy than Maxwell's equations have played in the past" (p. 18).

"Einstein's photoelectric equation has been subjected to very searching tests and it appears in every case to predict exactly the observed results. Planck's  $h$  has been photoelectrically determined with a precision of about 0.5 per cent and is found to have the value  $h = 6.57 \times 10^{-27}$ " (p. 388).

Millikan's associates, especially Kadesch, Hennings, and Souder, have extended this work.

The term "complete photoelectric emission" is applied to the photoelectric effect produced on a hot body by the light which it itself emits. As might be expected, this follows a law similar to that for thermionic currents. An address by Prof. O. W. Richardson before the Manchester meeting of the British association gives a comprehensive discussion of this subject. (*Phil. Mag.* 31, pp. 149-155, Feb., 1916.)

GENERAL RADIOACTIVITY. Richards and Wads-

\*  $p$  = work necessary to get an electron out of a metal.  
 $\frac{1}{2}mv^2$  = energy with which it leaves the surface.  
 $V$  = the potential difference against which it can drive itself.

worth have continued the investigations of Richards and Lambert (see 1914 YEAR BOOK) on the atomic weight of lead of radioactive origin. In addition to very careful determinations of the atomic weight and density of ordinary lead, they have made identically similar determinations on specimens of Australian radio-lead and radio-lead separated from Norwegian cleveite. The densities of the samples of radio-lead are 11.288 grams per cubic centimeter and 11.273 grams per cubic centimeter, respectively, while that of ordinary lead is 11.337 grams per cubic centimeter. The differences in density exactly parallel the differences in atomic weight, and indicate that the respective atomic volumes of these isotopes are almost exactly equal. If further confirmation were needed of the relationship of lead to radium it is furnished by the work of v. Hevesy and Paneth. A large amount of radium emanation was allowed to decay for several weeks in a quartz bulb and the deposit of radium D thus formed was dissolved in nitric acid. Various tests comparing the e.m.f.'s given by this solution and by a similar solution of lead gave identical results.

From time to time attempts have been made to influence the rate of radioactive transformations by employing extremes of temperature, pressure, high electric and magnetic fields, etc. Such attempts have always given negative results. This was to be expected in many cases, since temperature or compression, for example, are distinctly *molecular* influences. Something essentially *atomic* or *sub-atomic* is needed. Danysz and Wertenstein suggested that exceptionally great atomic shocks such as those produced by the impact of a particles might affect the rate of radio-active transformation. Their experiments, however, gave absolutely no trace of any such effect. The student of radioactivity was still in the position of one who watches and studies a complicated performance which he is powerless to influence in any way.

Wertenstein also made an important contribution to our knowledge of radioactive recoil. The early work of Makower and Russ had indicated that the recoil atoms carried a positive charge. From a series of very careful tests in high vacua Wertenstein concluded that the atoms of radium D recoiling from radium C were *not* charged at the instant of their production. However, as the gas pressure increases, these recoil atoms acquire a positive charge which gradually increases, eventually becoming equal to or even exceeding the charge carried by an a particle.

For some years it had been accepted that the disintegration of thorium C takes place in two distinct ways, about one-third of the atoms producing a particles of range 5.0 cm. in air, while the other two-thirds produce a particles whose range is 8.6 cm. This was studied in considerable detail by Marsden, Darwin Barratt, Fajens, and others. Rutherford and A. B. Wood discovered that the process of disintegration of thorium C was even more complicated. (*Phil. Mag.* 31, pp. 379-386, April, 1916.) About one ten-thousandth of the total number of a particles were emitted with extremely high velocities. About one-third of these have a range of 10.2 cm. while the others penetrate 11.3 cm. These ranges correspond to velocities far higher than had ever before been observed for

a particles, and the presence of a particles of four different speeds indicated that the disintegration of thorium C is an exceedingly complex process.

Caruthers called attention to an interesting relation in the case of the substances which emit  $\alpha$  particles. When the logarithm of the range of the  $\alpha$  particle is plotted against the logarithm of the atomic weight of the element emitting it, the points corresponding to each group of isotopes give a straight line. Moreover, the lines for the various groups are approximately parallel and equally spaced. From this he concluded that the range of the  $\alpha$  particles was universally proportional to approximately the twenty-first power of the atomic weight of the substance emitting it. Similar relations for the constants of  $\beta$  and  $\gamma$  rays were also deduced. Caruthers's article appeared (*Nature* 96, pp. 565-566, Jan. 20, 1916) some months before the work of Rutherford and Wood; apparently it would be difficult to fit thorium C into such a scheme as Caruthers suggests.

An excellent summary of the important work on radioactivity for the years 1914 and 1915 was made by G. L. Wendt. His paper includes a comprehensive table of the most recent values of the various radioactive constants. (*Phys. Rev.* 7, pp. 389-393, Mar., 1916.)

**SPECTRUM WORK AND GENERAL DISCHARGE IN GASES.** In the 1915 YEAR BOOK considerable attention was devoted to the work—both theoretical and experimental—on series spectra, especially those of hydrogen and helium. While the year 1916 witnessed several contributions along these lines, there were many important points which were still obscure. McLennan and his associates extended their work on the single line spectra of metals (1915 YEAR BOOK) to include magnesium vapor. Electrons which traverse magnesium vapor with an energy corresponding to a potential difference of 4.28 volts give the single line 2852.22 Å. U. This value for the "ionizing potential," like those for mercury, zinc, and cadmium, is in agreement with the quantum relation  $Ve = h\nu$ . The absorption spectrum of non-luminous magnesium vapor consists of the two lines 2852.22 Å. U. and 2026.46 Å. U.—the first and second members of the series.

The attempt to explain the single line spectra of mercury, zinc, cadmium, and magnesium on Bohr's theory of the structure of the atom leads to the conclusion that, if this theory is correct, Franck and Hertz and Newman misinterpreted their results on ionizing potentials. On studying ionization in flames McLennan found that when mercury vapor is fed into a bunsen flame it is ionized and radiates the line 2536.72 Å. U.; zinc vapor is not ionized and does not emit any of the characteristic spectrum of zinc; cadmium does not seem to be ionized but a weak flame gives the line 3260.17 Å. U., while in a strong flame the line 2288.79 Å. U. is added; magnesium is ionized and gives the line 2852.22 Å. U.; and thallium is strongly ionized, giving the lines 5350.65 Å. U. and 3775.87 Å. U. These results certainly are not conclusive either as supporting or as definitely invalidating Bohr's theory. At the time of writing, the whole question of ionization potentials seemed to be in a very uncertain state. (The work from McLennan's laboratory was published

chiefly in the March and October issues of the *Proceedings of the Royal Society.*)

Questions concerning the hydrogen and helium spectra mentioned in the 1915 YEAR BOOK still seemed far from solution. Evans and Croxson have made a further study of the line 4686 which, according to Bohr's theory, belongs to the helium spectrum. With the form of tube which they used, the ordinary helium lines were very intense. This line was comparatively faint but it was very sharp and its structure in general agreed with theory. On the other hand, Richardson and Bazzoni found that the spectrum of helium could be produced under conditions which directly contradict Bohr's theory.

In 1907 R. W. Wood showed that the principal series of sodium is much more complete when observed as an absorption spectrum than when studied as an emission spectrum. The earlier work gave a total of 48 lines in this series. Quite recently, at Zurich, Wood and Fortrat made a further study of this series. Thanks to the use of a very powerful quartz spectograph, giving the equivalent of 13 60° prisms, they were able to observe 10 new lines at the head of the series. The first seven lines were found to be doublets. The results agree closely with the requirements of Ritz's formula. An idea of the difficulties of this work can be gained from the statement: "The last 32 members cover a spectral range not wider than the distance between the D lines."

Wood and Kimura made a further study of the resonance in mercury vapor. (For earlier work see 1912 YEAR BOOK.) They found that the scattered resonance radiation from a quartz bulb filled with vapor decreases rapidly with increased pressure and is gradually replaced by absorption; when the pressure reaches about 10 cm. regular (specular) reflection begins. The theoretical phases of resonance spectra are discussed by Silberstein in the September number of the *Philosophical Magazine*.

**X-RAYS.** The work on high frequency spectra, initiated by Moseley (1914 YEAR BOOK), was continued and extended during 1916 by Siegbahn and his associates. Moseley's work, it will be recalled, showed that only three elements remained undiscovered between aluminum and gold. By extending the work from gold to uranium Siegbahn and Firman demonstrated that we might expect to discover six new elements between bismuth and thorium and one between thorium and uranium. This last conclusion was confirmed by some recent work of de Broglie. In their work on the "K-series" of the elements from sodium to cerium, Siegbahn and Stenström obtained results which confirm Moseley's earlier work, the small discrepancies being due, in all probability, to slight uncertainties in the exact values of the  $\lambda$ . Their papers gave excellent tables of wave-constants upon which the calculations are based. lengths of these characteristic radiations. (*Phys. Zeitschrift* 17, pp. 17-18, 48-51, and 318-319, 1916; *Phil. Mag.* 31, pp. 403-406, 1916.) Siegbahn and Firman investigated the "L-series" for a number of elements including polonium, radium, and thorium. (*Phil. Mag.* 32, pp. 39-49, 1916.)

Siegbahn further claimed the discovery of a new group of lines of longer wave-length—the "M-series"—in the high frequency spectra of

uranium, thorium, bismuth, lead, thallium, and gold. Since this radiation is very easily absorbed by the air, his apparatus consisted essentially of a spectograph in vacuo, using a gypsum crystal as the analyzer. He succeeded in measuring the wave-length of six of the lines of this series in the spectrum of uranium and detected several other more feeble lines. The spectra of the other elements were found to be similar to that of uranium. (*Comp. Rend.* 162, pp. 787-788, May 22, 1916.)

The frequent use of tungsten as the target in X-ray tubes lent considerable interest to the study of its spectrum. Values obtained by Gorton, using a Coolidge tube and stationary crystals of rock-salt and calcite, agreed with earlier work by de Broglie but were uniformly lower than those published by Barnes (1915). A. H. Compton devised a modification of the Bragg spectrometer which converts it into a convenient recording instrument. With this he "mapped" the seven lines already known in the spectrum of tungsten and found indications of at least six more. He also detected some evidence of polarization due to reflection by the crystal. (*Phys. Rev.* 7, pp. 646-659, 1916.)

The relation between the maximum frequency of X-rays emitted by a tube and the potential difference across it for voltages from 30,000 to 100,000 was investigated by A. W. Hull. Throughout this range he found the maximum frequency accurately proportional to the applied voltage, with no evidence of the frequency maximum at 145,000 volts which was reported by Rutherford. (See 1915 YEAR BOOK.) Duane recently showed that the method of measurement used by Rutherford—based on the absorption coefficient—did not, at high voltages, give the maximum frequency produced. Hull stated that "the maximum frequency for voltages up to 100,000 is given accurately by the quantum relation, and there is no reason to believe that it should not continue to increase with voltage indefinitely."

Another notable contribution connecting the quantum theory with X-rays was made by D. L. Webster. (*Phys. Rev.* 7, pp. 599-613, June, 1916.) He studied the radiation from a Coolidge tube with a rhodium target, using a calcite crystal and a modified Bragg spectrometer. An interesting feature of this investigation was the use of a battery of over 20,000 storage cells—giving from 42,000 to 44,000 volts—to excite the tube. The steady potential difference thus secured was of great advantage in giving strictly uniform conditions. From his results Webster computed the value of Planck's constant as  $h = 6.53 \times 10^{-27}$ —a remarkable agreement with Millikan's value.

The work of Barkla on absorption of X-rays taken with Moseley's table of wave-lengths shows that the coefficient of absorption of all metals for X-rays varies approximately as the cube of the wave-length, except in the immediate vicinity of one of the wave-lengths characteristic of the metal. Though the experimental data cover the range 4 Å. U. to 0.5 Å. U., this relation has often been extrapolated to use as a measure of very short wave-lengths. Recent work by Hull and Rice on the absorption of X-rays by aluminum, copper, and lead showed the conditions under which such extrapolation was justified. Their measurements cover the range from 0.4 Å. U. to 0.1 Å. U. When a

beam of X-rays is absorbed, some of the energy is reëmitted as radiation of the same wave-length as the incident beam; this is the "scattered" radiation studied by Barkla several years ago. The remainder of the absorbed energy is transformed into energy of a different form or a different wave-length, i.e. heat, fluorescent radiation, etc., etc. Barkla's earlier work showed that the coefficient of scattering per unit mass is independent of the wave-length. By making a constant correction for this, Hull and Rice showed that the "corrected absorption coefficient" or "transformation coefficient" was directly proportional to the cube of the wave-length.

The absorption coefficient of soft X-rays produced at voltages below 10,000 was studied by C. D. Miller. His results in general agree with those of Siegbahn obtained in 1915.

Vegard, using a Bragg spectrometer, found that the atomic structure of crystals of silver, copper, gold, and lead was a face-centred cubic space lattice. Forman has shown that by magnetizing iron in a direction parallel to the path of X-rays, its opacity is increased.

From time to time since X-rays were first discovered, attempts have been made to detect some evidence of refraction when they pass through matter. Before their true nature was established by the work with crystals (see 1913 YEAR BOOK), these attempts were haphazard. In a recent article (*Phil. Mag.* 31, pp. 257-260, April, 1916), Barkla shows that if the usual simple theory of dispersion, applicable to radiation of longer wave-length, applies also to X-rays, it is just possible that some evidence of refraction might be detected. He emphasizes the point that an *optically plane* surface is really quite *rough* in comparison to the wave-length of X-rays. Therefore, for his experiments he used 90° prisms of potassium bromide, the faces of which were crystalline. He used two prisms placed one above the other with their bases in opposite directions. Half of a very narrow parallel beam of homogeneous X-rays passed through each prism. In this way any deviation would be doubled. Though his apparatus was capable of detecting as little deviation as 2 seconds of arc, absolutely negative results were obtained. A somewhat similar attempt by D. L. Webster and Harry Clark to detect refraction gave similar negative results. (*Phys. Rev.* 8, pp. 528-533, Nov., 1916.) These very careful experiments were of interest not only in connection with X-rays but also as showing the limitations of our present theories of dispersion.

NOTABLE LECTURES. The preceding paragraphs give only the most important of the recent advances in this most fascinating field. The reader who desires a more comprehensive review will do well to refer to the reports of several recent lectures. Notable among these are the Bakerian Lecture "X-Rays and the Theory of Radiation" by Barkla (abstract in *Roy. Soc. Proc. A* 92, pp. 501-504, Aug., 1916); Sir J. J. Thomson's lecture before the Royal Institution on "Genesis and Absorption of X-Rays" (*Engineering*, 101, pp. 406-407, 1916); and "Recent Work on X-Rays and Crystals and Its Bearing on Chemistry" by W. H. Bragg (*Chem. Soc. Trans.* 109, pp. 252-269, 1916).

MISCELLANEOUS CONTRIBUTIONS. The attempt to give a rigorous explanation of some one of

the very common phenomena of nature often results in showing how very little is really known about matters which are usually taken for granted. Every surveyor is familiar with the diurnal fluctuations of the earth's magnetism. In 1908 Schuster attempted to account for these variations by a theory which assumed that the upper atmosphere is a region of high electrical conductivity—an assumption in favor of which there is certainly much evidence. The ultra-violet radiation from the sun is a possible source of this ionization. However, on attempting to compute the magnitude of this effect Swann finds that the conductivity of this region is only about  $\frac{1}{1000}$  of the value required by Schuster's theory. (*Terrest. Mag.* 21, pp. 1-8, Mar., 1916.) Of course, as he points out, the values in the calculations may be in error. Thus, if the pressure were less than the value assumed, the conductivity would be increased. But it is obvious that at present this is not a quantitatively satisfactory theory.

The amount of electricity carried by an ordinary lightning flash has been estimated by C. T. R. Wilson as about 30 coulombs. (*Proc. Roy. Soc.*, 92 A, pp. 555-574, Sept., 1916.) W. J. Humphreys has made a very different estimate of the magnitude of the particular discharge which crushed a certain copper lightning conductor and fused it at the upper end. Assuming that the discharge lasted 0.01 second, a calculation based on the mean specific heat of copper gave the average current the enormous value of 90,000 amperes, with a crushing pressure due to the "pinch effect" of 400 pounds per square inch.

Some conclusions which were put forward by Shaw concerning the effect of temperature on the constant of gravitation seemed rather staggering. (*Roy. Soc. Phil. Trans.* 216, pp. 349-392, May 27, 1916.) In most of the classical determinations of this constant, great care had been taken to insure constant temperature in order to avoid possible errors due to unequal expansion, air currents, etc. Moreover, in such work as that of Poynting and Phillips (1905), where an attempt was made to detect a temperature effect, the attraction was measured between a small mass and the earth. It was therefore impossible to alter the temperature of both bodies. In Shaw's experiments, which extended over several years, a torsion balance of the Cavendish type was used. The temperature of both large and small attracting masses was varied from 15° C. to 250° C. The author's conclusion is that instead of the familiar equation

$$f = G \frac{M m}{d^2} \text{ we should write } f = G (1 + a t) \frac{M m}{d^2}$$

where  $a$  has the value  $1.20 \pm 0.05 \times 10^{-5}$  per degree Centigrade.

As might be expected, the publication of Shaw's paper aroused much comment. Larmor, Barton, and others have pointed out many unquestioned facts which seem to contradict Shaw's conclusions. For example, the neglect of the temperature effect would introduce errors of such magnitude in certain astronomical calculations as to render them wholly unreliable. The outcome of this discussion was awaited with interest.

The influence of the war is manifest in many ways aside from the fact that it had stripped the European laboratories of some of their best

men. Numerous observations on the propagation of intense sounds at great distances were published. The precision required of modern artillery resulted in several investigations on the motion of solids through resisting media. The fact that modern long range shells travel for a part of their trajectory through the very rarified upper atmosphere led to the revision of many tables of ballistics. While work of this nature is to be anticipated, one would hardly expect that it would be published as scientific research in such periodicals as the *Proceedings of the Royal Society*. (See for example, No. A 640 pp. 329-337, April, 1916.) Some results are certainly surprising. For example, it was pointed out by de Sparre that a rise in temperature of less than 25° F. and a drop in the barometric pressure of less than half an inch may result in increasing the range of a large gun by over a mile.

In earlier articles on Physics in the YEAR BOOK, comment has been made upon Dr. Gaede's contributions in inventing pumps for the production of high vacua. The best of his inventions, however, was surpassed by pumps perfected by H. B. Williams (*Phys. Rev.* 7, pp. 583-584, May, 1916) and Langmuir (*Phys. Rev.* 8, pp. 48-51, July, 1916); *Jour. Franklin Inst.* 182, 6, pp. 719-743, Dec. 1916). These pumps, though developed independently, are essentially the same. A general idea of their action is given by this quotation from the second of Langmuir's articles: "Two new types of condensation pumps are described, one built wholly of glass and the other wholly of metal. In these pumps a blast of mercury vapor carries the gas into a condenser . . . the gas to be exhausted is caught by the blast of vapor and is forced by gas friction to travel along a cooled surface. By maintaining this surface at such a low temperature that the condensed mercury does not re-evaporate at an appreciable rate, it is possible to keep the vapor from escaping into the vessel being exhausted. . . . The condensation pump is characterized by extreme speed, by simplicity and reliability, and by the absence of a lower limit (other than zero) to which pressure may be reduced."

On the usually accepted theory that an electric current in a conductor consists of a motion of "free" electrons, it follows that an electric charge should be manifested when a conductor is accelerated or when it is subjected to the action of centrifugal force. It would be very difficult to detect the latter effect in solid conductors on account of the disturbing effects introduced by the inevitable sliding contacts, but it has been observed in electrolytes. Tolman and Stewart published an account of a study of the acceleration effect (*Phys. Rev.* 8, pp. 97-116, Aug., 1916). In these experiments about 510 yards of fine copper wire were wound on the rim of a wheel some 10 inches in diameter. This wheel was driven by a one and a half horse power motor at speeds up to 5000 r.p.m., giving linear velocities ranging from 60 to 190 feet per second. The wheel could be stopped in "a fraction of a second" giving accelerations of the order of 10 times that of a freely falling body. The coil was connected to a very sensitive ballistic galvanometer and the effect was measured by the "throw" of this instrument when the wheel was stopped. In order to guard against errors it was necessary to make the entire apparatus of non-magnetic material and to arrange various

auxiliary coils to neutralize the vertical and horizontal components of the earth's magnetic field. With these elaborate precautions, the results were in satisfactory agreement with theory and confirm the conclusion that conduction in metals consists in the drift of free electrons.

**PHYSIOGRAPHY.** See GEOLOGY, *Physiography*.

**PIERROT THE PRODIGAL.** See DRAMA.

**PIERS.** See DOCKS AND HARBORS.

**PIG IRON.** See IRON AND STEEL.

**PIGS.** See STOCK RAISING AND MEAT PRODUCTION.

**PINCKNEY, MERRITT W.** See JUVENILE COURTS.

**PITRÉ, GIUSEPPE.** An Italian folklore scholar and antiquary, of Palermo, died in 1916. He was born in 1843, was early attracted to linguistic and archeological studies, and later became a great authority on the antiquities, traditions, dialects, and national songs of Sicily. He was one of the founders of the *Nuove Efemeridi Siciliane* (1868) and of the *Archivio per lo studio delle tradizioni popolari*. His most important work is the *Biblioteca delle tradizioni popolari siciliane* (19 vols., 1870-95). He also published *Curiosità popolari tradizionali* (10 vols., 1885-91) and *Bibliografia delle tradizioni popolari d'Italia* (1894).

**PITTMAN, KEY.** Relected Democratic United States Senator from Nevada, Nov. 7, 1916.

**PITTSBURGH, UNIVERSITY OF.** A non-sectarian co-educational institution at Pittsburgh, Pa., which in 1908 changed to its present name from that of the Western University of Pennsylvania. In 1916 there were enrolled 4076 students. The faculty numbered 451. In productive funds the institution had \$561,679, and drew an income of \$27,388. There were 23,000 volumes in the library. Chancellor, Samuel Black McCormick.

**PITTSBURGH INTERNATIONAL EXHIBIT.** See PAINTING AND SCULPTURE.

**PLANETS AND PLANETIDS.** See ASTRONOMY.

**PLANT BREEDING.** See BOTANY; HORTICULTURE.

**PLANT DISEASES.** See BOTANY.

**PLANT QUARANTINES AND REGULATIONS.** See HORTICULTURE.

**PLATINUM.** Platinum was produced in California and Oregon in 1915. The total production was 741 troy ounces, having a value of \$23,500. Most of the crude platinum came from California, only one mine in Oregon affording a production in 1915.

The world's production of platinum in 1915 was 143,145 troy ounces, compared with 216,548 in 1914. By far the largest part, 124,000 ounces, came from Russia. The total imports of platinum and allied metals into the United States in 1915 were 68,778 troy ounces, valued at \$2,768,688, compared with 76,810 troy ounces, valued at \$3,248,858 in 1914.

In 1916 platinum was indeed a rare metal owing to demands by the jewelry trade where it was needed for setting and to its industrial uses. A maximum price of \$105 per troy ounce was reached in late November and the average price for the refined metal in New York in 1916 was \$83.40 as compared with \$47.13 in 1915, \$45.14 in 1914, \$44.88 in 1913, \$45.35 in 1912, and \$43.12 in 1911.

The following figures by the United States Geological Survey give the best estimates from information available at the end of 1916, but are to be considered as but approximate:

ESTIMATE OF WORLD'S PRODUCTION OF CRUDE PLATINUM

Country	1913	1914	1915	1916
Borneo and Sumatra	200	200	*	*
Canada	30	50	30	100
Colombia	12,000	15,000	17,500	19,000
New South Wales	778	1,275	1,248	756
Russia	300,000	250,000	241,200	124,000
United States	721	483	570	742
	313,729	267,008	260,548	143,896

\* No basis for estimate. † No figures from Tasmania available at time report goes to press.

Platinum valued at \$504,302 was invoiced at the American Consulate at Cartagena, Colombia, for the United States during 1915, compared with \$357,519 worth for 1914.

In Russia the demand for home use, especially for acid work, was large, and the price for crude metal, high. In January the Russian government prohibited all holders of platinum—banks, mining companies, individual miners, dealers, jewelers, etc.—from selling or alienating in any way the metal which they held. The entire stock of platinum in Russia was to be requisitioned by the government at a price not then announced. This order, naturally, stopped all business in Russia. Later, the government rejected a proposal that all metals must be delivered to government offices as produced. The platinum that had already been taken over was bought by the government at a fixed price, but the subsequent production and market were left free, and with a confused market after the metal was released for export, sales were resumed on a rather small scale.

The Russian government having agreed to pay for the platinum taken at the price of 67,305 rubles per pood, prices on private sales rose to a corresponding level. With the government announcing an increased price the large companies in Russia renewed the development work at their properties, and two dredges were ordered for the platinum mines in the North Ural. There was a revival of the industry throughout the country, and with the increased demand there followed an increase in prices, and from Ekaterinburg it was reported that production had been reduced, owing to mobilization among the miners, which also helped the advance.

Although Russian dredging was proceeding to its fullest extent, at the end of the third quarter of the year the demand was sufficient to cause a further price increase.

See CHEMISTRY, INDUSTRIAL.

**PLATYHELMINTHES.** See ZOOLOGY, *Platyhelminthes*.

PLAYGROUND AND RECREATION ASSOCIATION OF AMERICA.

The association was organized in Washington, D. C., in 1907. Since then the movement for playgrounds and neighborhood recreation centres for young and old has spread rapidly, statistics showing that during 1916 at least 480 cities conducted playgrounds and recreation centres under leadership. The cities reporting on expenditures stated that they had expended \$4,234,718.45. Many cities which have not already established year-

round systems of recreation headed by recreation secretaries or superintendents of recreation are now working with the assistance of the field secretaries of the association to put their recreation work on a permanent basis which will correspond with the school system.

Through the employment department of the association many officials have been enabled to select workers of training and experience. Communities not only in all parts of the country but also in foreign lands have been aided through correspondence. As a part of its educational and propaganda work the association publishes a monthly magazine, *The Playground*, and many pamphlets on all phases of recreation work. The officers of the association, which has headquarters at 1 Madison Avenue, New York City, are: President, Joseph Lee; first vice-president, H. P. Davison; secretary, H. S. Braucher; and treasurer, Gustavus T. Kirby. Theodore Roosevelt is honorary president.

**PLEASANT, RUFFIN G.** Relected Democratic Governor of Louisiana, Nov. 7, 1916. See LOUISIANA.

**PLUMMER, MARY WRIGHT.** An American librarian, died at Dixon, Ill., on Sept. 21, 1916. She was born in Richmond, Ind., and was educated at Wellesley College and Columbia University, where she was a member of the first class to study library science at that institution. She was librarian of the Pratt Institute Free Library, Brooklyn (1896-1904), and also director of the Pratt Institute Library School (1896-1911), and from 1911 until her death she was principal of the Library School of the New York Public Library. In 1915-16 she was president of the American Library Association, and in 1906 president of the New York State Library Association. She was a delegate from the United States to the International Congress of Libraries at Paris in 1900. Her publications include: *Hints to Small Libraries* (4th ed., 1911); *Verses* (1896); *Contemporary Spain* (1899); *Roy and Ray in Mexico* (1907); *Roy and Ray in Canada* (1908); *Stories from the Chronicle of the Cid* (1910).

**PODBIELSKI, VIKTOR A. VON.** A German general and public official, died in Berlin Jan. 25, 1916. Born at Frankfort-on-the-Oder in 1844, the son of Gen. Theophil Podbielski, he had a military training, served in the wars of 1866 and 1870-71, and by 1891 had risen to the rank of major-general. After 1893, when he entered the Reichstag, most of his attention was given to political affairs. In 1897 he was appointed postmaster-general and from 1901 to 1906 was minister of state. He was also minister of agriculture from 1901 to 1906. As postmaster, he organized the German telephone system and helped to bring Germany and the United States into direct communication by cable.

**POETRY.** See LITERATURE, ENGLISH AND AMERICAN; also articles on French, German, Italian, Russian, Scandinavian, and Spanish Literatures.

**POHL, HUGO VON.** A German naval officer, died in Berlin Feb. 24, 1916. He was born at Breslau in 1855. A lieutenant at 21, he later was lieutenant-captain of the corvette *Carola*, and captain of the cruiser *Hansa*. In 1900 he was present at the bombardment of the Taku forts, China. By 1905 he had risen to commodore, by 1909 to vice-admiral, and subsequently was admiral and chief of the admiralty

staff from 1909 to 1915. In February of the latter year he succeeded Admiral von Ingenohl as commander of the German battle fleet, a post he resigned because of ill health only a few days before his death.

**POILU.** A nickname for the French common soldier, in general use during the War of the Nations.

**POINCARÉ, RAYMOND.** See FRANCE, *History*.

**POINDEXTER, MILES.** Relected Republican United States Senator from Washington, Nov. 7, 1916.

**POISONING, INDUSTRIAL.** See OCCUPATIONAL DISEASES.

**POISONING, RHUS.** See RHUS POISONING.

**POLAND.** A former European kingdom, partitioned (in 1772, 1793, and 1795) between Russia, Austria, and Prussia. At the period of its greatest extent, the kingdom embraced the country now included in Livonia, Courland, Russian Poland, West Russia, a part of Little Russia, the East Prussian district of Ermland, West Prussia, Posen, and Galicia.

The term Poland is now commonly used for Russian Poland, occupied by the Germans in 1915. (See RUSSIA; WAR OF THE NATIONS.)

This, the most westerly portion of the Russian Empire, consists of nine governments, viz.: Kalisz, Kielce, Lomza, Lublin, Piotrków, Plock, Radom, Suwalki, and Warsaw. The latest *Annuaire statistique de la Russie* gives the area of these nine governments as 99,691.1 square versta (43,945.5 square miles). The estimated population Jan. 1, 1914, was 12,247,600 (6,149,200 males, 6,098,400 females). The rural population was estimated at 9,226,300, and the urban at 3,021,300. The population of the country as constituted at the time of the Russian census (1897) was 71.8 per cent Polish, 13.5 Jewish, 6.7 Russian, 4.3 Germanic, 3.3 Lithuanian. The Lithuanians are almost wholly in Suwalki, where in 1897 they formed 52.3 per cent of the inhabitants. About three-fourths of the people are Roman Catholic. In 1897 persons able to read were 305 (342 males, 268 females) per thousand. The largest city of Poland is Warsaw; its estimated population Jan. 1, 1914, was 909,491. The second city is Lodz, with over 400,000 inhabitants.

**POLAR RESEARCH.** The polar explorations of 1916 are almost entirely continuations of enterprises antedating the European war. Four expeditions were still in the field—those of MacMillan, Rasmussen, Steffánsson, and the Shackelton relief party. It may be added that at the end of the year no tidings had come from the Brusiloff and Rusanoff expeditions in the Siberian Ocean, but Russian authorities were offering rewards for information as to the fate of their members. While it is not within the scope of this article to reopen discussions as to the facts concerning the attainment of the North Pole, yet the subject of Polar Research is involved in two searching analyses of the documents published relative thereto, which have passed into permanent official records. These analyses, made by Congressman H. T. Hegelsen, form parts of the *Congressional Record*; that relative to Rear Admiral Peary on August 3rd, and that as to Dr. Cook on Dec. 21, 1916.

**ANTARCTIC.** It is many years since any polar venture has been marked, without loss of life, by experiences as varied and dangerous as those

of the two Antarctic expeditions of Sir E. H. Shackleton. His plans included the establishment of a temporary camp on Luitpold Land, Weddell Sea, in about 78° south latitude. From this base he was to lead a party across the unknown areas of the glacier-covered continent of Antarctica, where he was to be met at Ross Bay, Victoria Land, by a ship from Australia. Sailing from South Georgia Dec. 8, 1914, in the *Endurance*, after a voyage through ice-floes for 1000 miles Shackleton sighted on Jan. 10, 1915, Coats Land, but was unable to reach it. Later an unknown land, some 200 miles in extent, named Caird Coast, was discovered, from which enormous glaciers were discharging into the ocean. In February, 1915, the *Endurance* was inextricably beset by heavy floebergs and could neither advance nor retreat. Thenceforth her course was with the drifting pack, which carried her southwest to 77° S., 35° W., her extreme southing, and then in zigzag fashion to the northwest. From July onward the ship was almost daily threatened with destruction, and was finally crushed and sunk by overwhelming floes in 69° 05' S., 51° 32' W., on Oct. 27, 1915, 346 miles from the nearest northern land. Alternate efforts to travel north by sledge or by boat were fruitless, and the shipwrecked men established quarters on the slowly drifting pack for nearly six months, supplementing their food by dogs and occasional seals. March 27, 1916, the peaks of Joinville Land were sighted, and on April 7 they were near Clarence Island, the easternmost point of the South Shetlands. Their great floeberg was now broken up by strong swells, and they were forced to enter a heavy sea in their tiny boats—having drifted 700 miles. After 10 days of arduous and dangerous ice-navigation they landed on Elephant Island, many of the men almost collapsed. Conditions were desperate, the island being glacier-capped, while the narrow beach was storm-swept and uninhabitable, so that they were obliged to excavate a cave in the glacier-cliff for shelter. Shackleton rose to the occasion. Leaving Wild in charge of 22 men, with food for five weeks, he dared the perils of an autumnal voyage of 750 miles to South Georgia for relief. With five volunteers Shackleton made the voyage in an open 22-foot boat, partially decked with box-lids, etc., in 16 days. On May 10th he landed on the uninhabited west coast of South Georgia, and crossing the unknown ice-covered mountains reached, 10 days later, the Norwegian whaling station. Three successive attempts to relieve the marooned men failed—through a Norwegian whaler, an Uruguayan trawler, and an English ship. Undismayed, Shackleton continued his efforts, and finally rescued the men, all well, from Elephant Island by the Chilean ship *Yelcho*, on Aug. 30, 1916.

Penguin, shell-fish, and seal had supplemented their food supplies and saved them from starvation.

Meanwhile, Shackleton's supporting ship, the *Aurora*, was sent in the Antarctic summer of 1914-15, under Capt. E. Mackintosh. She reached Ross Sea safely and her crew began their work of establishing food-depots on the Ross (Barrier) oceanic-glacier for Shackleton's coming. Finding no safe harbor the ship was moored and anchored to the ground-ice at Cape Evans where the shore-party worked. Moving floes and gales forced her off-shore several times. On

May 6, 1915, a terrific blizzard broke the moorings and drove the *Aurora* into the ice-fields where she was inextricably beset. Drifting north, after many weeks she escaped from the ice, and short of food and coal made her way to Australia. Captain Mackintosh and five men were left ashore in their temporary camp. There was no danger of starvation, as at or near Cape Evans were food supplies sufficient for them up to January, 1917, with sea-game plentiful. In December, 1916, Shackleton started from New Zealand with the relief-ship *Aurora*, commanded by Capt. John King Davis, an ice-master of exceptional skill and experience, to rescue Mackintosh and his party. Davis had been commander of the *Aurora* in five Antarctic voyages of Sir Douglas Mawson's Australasian Expedition (1911-14) and had made important discoveries.

ARCTIC. The Arctic expedition sent into Polar Canada under V. Stefánsson in 1913, by the Dominion of Canada, has finished its work in part. Stefánsson's researches contemplated separate parties, one for geographical exploration, led by himself, and the other, scientific, under Dr. Rudolph M. Anderson, who, since 1913, had been zoölogist of the Geological Survey of Canada. Anderson has finished his field work but Stefánsson is yet in the North. It will be recalled that the loss of the *Karluuk* in 1913 deranged all plans. After wintering (1913-14) at Collinson Point, near Camden Bay, Anderson proceeded in the schooner *Alaska* eastward, and established his headquarters on the south side of Dolphin Strait, where a house was built. For two years (1914-16) his party was occupied in thoroughly exploring adjacent regions. Chipman and O'Neill surveyed the Arctic coasts from Cape Barrow eastward to Stapyilton Bay. Cox extended this work to Rae River, which was explored about 75 miles from the mouth, and from the farthest point a traverse was carried across country for geological purposes. A geological reconnaissance was made of the whole Arctic coast from Bathurst Inlet to Barrow. The lower reaches of the Kogluktualuk River were explored, as were the 150 or more islands of the Chapman, Lewis, and Marcet groups. Meteorological observations were regularly made, and tidal readings when practicable. More than 1000 specimens of birds and mammals were brought back, as well as 30 tons of geological and other specimens. Jenness, the ethnologist, exhaustively studied the primitive Eskimos of Victoria Island, as to their domestic life, game, methods, language, customs, and amusements. The geological investigations promise to be of economic value. Coal beds several feet thick were found. The most important discoveries were large areas, near navigable waters, of country in which there were extensive deposits of low-grade copper ore. The deposits, which are easily workable, resemble the Lake Superior copper rock. Stefánsson has continued his geographical work with the pertinacity and resourcefulness characteristic of the man. As previously stated (YEAR BOOK, 1915), by a remarkable sledge journey northward over the ice of the Arctic Ocean he discovered new land in 78° N., 117° W., trending for 100 miles from southeast to northwest. Wintering on Banks Land, Stefánsson continued his original efforts to determine whether or not a large area of land exists between Alaska and the Pole, as forecast by Greely and Harris. The specific plans for 1916 looked to the exploration



of the unknown areas lying west, northwest, and northeast of the Parry Islands. Stefánsson assigned to himself a sledge journey across the sea-ice for 60 to 75 days from Cape Albert, expecting to reach 83° N., 145° W. Another party of six men and four sledges would attempt to reach 78° N., 117° W. It was hoped that one of Stefánsson's ships might reach Melville Island during the navigable season of 1916, so that it might form a winter base for 1916-17. The party expected to return south in the autumn of 1917.

Danish explorers continue their researches in continental Greenland. Its most notable representative at present is Knud Rasmussen, distinguished for service with Mylius-Erichsen (1902-04) and by his trans-Greenland journey of 1600 miles. His base of operations is Thule, a scientific station established by him in 1915, a short distance north of Cape York, which is permanently in charge of his subordinate, Freuchen.

Delayed in his northern voyage to Thule by unfavorable ice conditions in Baffin Bay, Rasmussen necessarily postponed to 1917 his project of crossing again the inland ice of Greenland in order to explore the unknown peninsula between Independence Fiord and Nordenskiöld Inlet. Instead he passed the late summer of 1916 in making a thorough exploration of the coast of Melville Bay between the districts of Upernivik and Cape York. He planned to determine its conditions as to archæology, botany, ethnography, cartography, and zoölogy.

Despite the energy and persistency of its members and of its supporters, the expedition headed by Donald B. MacMillan, has experienced successive disappointments and misfortunes. In 1914 it was unable to reach Bache Peninsula, Ellesmere Land, and had to establish its base at Etah, Greenland. The the mirage-luring Crocker Land, of Peary, 1906, disappeared when, by an arduous and dangerous journey, MacMillan and Green sledged across its alleged site. In 1915 Dr. E. O. Hovey's relief ship, the *Cluett*, broke down and, unable to reach Etah, was ice-bound in Parker Snow Bay. Green, Allen, and Tanquary returned by a sledge journey across Melville Bay to Upernivik. MacMillan and Ekblaw planned new scientific work while awaiting relief. In 1916 the Danish steamer *Danmark*, sent to the relief of Hovey and MacMillan, was evidently ice-bound, as on August 20th she was seen in Melville Bay, 76° N., 60° W., working northward through heavy ice. See also ALASKA.

**POLIOMYELITIS.** During 1916 a severe epidemic of poliomyelitis, commonly known as Infantile Spinal Paralysis, raged in New York City and State and in several neighboring States. Beginning in the early summer, there were, up to the middle of October, when the epidemic began to disappear, 9029 cases of poliomyelitis in New York City alone, under quarantine. Two hundred and fifty of these cases, however, were found not to be true cases of the disease. The total number of deaths was 2362, a mortality percentage of 26.44. Of the cases treated in hospitals 66 per cent showed evidence of paralysis; in 15 per cent paralysis had entirely disappeared; and in another 15 per cent there had not been any paralysis during the attack. In the State outside of New York City there were, up to September 14th, 2785 cases with 318 deaths. Connecticut had 677 cases (deaths not

reported); Massachusetts, 678 cases and 95 deaths; New Jersey 3495 cases, 775 deaths; and Pennsylvania 1278 cases, 313 deaths. In Wisconsin the State Board of Health reported 316 cases of poliomyelitis up to September 30th. The province of Ontario, Canada, was also visited by the epidemic and reported 49 cases with 5 deaths in September, 44 cases with 5 deaths in August, and 20 cases with 3 deaths in July. The New York State Health Department recorded 224 cases in 1914 with 68 deaths, while in 1915 there were 261 cases and 47 deaths.

Several laboratory workers have announced the discovery of what appeared to be the causative organism of this disease, but it cannot be authoritatively stated that the true germ has been found, nor do authorities agree as to the method of spread, mode of infection, and contagiousness of the virus. It has been shown, with a fair degree of accuracy, that the virus is contained in the lymphoid tissue in the pharynx, and emulsions of this tissue injected into monkeys will produce paralysis and other symptoms of the disease in these animals. Although ignorant of the method by which the disease is spread, the health authorities enforced strict quarantine as the best precaution available. This epidemic, as did previous epidemics, died out with the advent of cooler weather. Several types of the disease were recognized, the diagnosis in those cases showing no paralysis being largely made by an examination of the spinal fluid. Treatment was symptomatic and expectant, although some cases were treated by injection of serum drawn either from individuals who had recovered from the disease or from normal individuals. In New York City there were 420 cases treated with immune blood and 30 with normal blood serum. Many patients seemed to be favorably influenced, or their symptoms mitigated, by the serum injections, but no definite statement as to the value of treatment has been practicable.

A. Netter, of Paris, commends the treatment by serum and records 34 cases treated, of whom 8 were completely cured, 3 nearly cured, 9 materially improved, and 3 less markedly improved; while 8 cases died. He advocates injecting the serum into the spinal canal.

Some evidence has been adduced that insects and rats may carry the infection. In Massachusetts observations seem to show that the disease is endemic along the course of the rivers, most of which are polluted by sewers and infested with rats. Richardson believes that the rôle of cats, dogs, and other animals as carriers of infected fleas, merits consideration, the known facts with regard to the dissemination of poliomyelitis squaring with this hypothesis better than with any other theory.

**POLISH RELIEF.** See RELIEF FOR WAR VICTIMS, section so entitled.

**POLITICAL AND SOCIAL SCIENCE,** AMERICAN ACADEMY OF. In December, 1916, the membership of the academy was 6603. All the officers for 1915 were reelected in 1916, L. S. Rowe being president. It was announced that the 21st annual meeting would be held April 20-21, 1917. The following subjects were treated in the bimonthly *Annals* of the academy: "National Industries and Federal Government," (January); "Public Administration and Partisan Politics," (March); "Personnel and Employment Problems in Industrial Management"

(May); "Preparedness and America's International Programme" (July); "New Possibilities in Education" (September); "America's Changing Investment Market" (November). Of these issues C. H. Crennan, Meyer Bloomfield, Joseph H. Willits, Ambrose L. Subrie, and E. M. Patterson were editors. As a supplement, the 25th anniversary index of the *Annals* was published in March. As a supplement for May appeared "Steadying Employment" by Joseph H. Willits.

**POLITICAL ECONOMY.** The YEAR BOOK contains numerous articles treating matters of economic import. Under FINANCIAL REVIEW is given a general survey of business and financial conditions in the United States, Great Britain, France, Germany, Russia, Japan, and Canada. Under LABOR will be found references to subjects treating various aspects of industry; and likewise BANKS AND BANKING includes information regarding banking developments at home and abroad and gives references to other related articles. See also INSURANCE; OLD-AGE PENSIONS; PRICES; SOCIAL ECONOMICS; SOCIOLOGY; TARIFF; TAXATION; and TRUSTS.

THE AMERICAN ECONOMIC ASSOCIATION held its 29th annual meeting at Columbus, Ohio, December 27-30. Its opening sessions consisted of the following presidential addresses: Thomas N. Carver of this association, "The National Point of View in Economics"; George E. Vincent of the American Sociological Society, "Countryside and Nation"; Charles P. Neill of the American Statistical Association, "Opportunities for Practical Work by the Statistical Association"; Irving Fisher of the American Association for Labor Legislation, "The Need for Health Insurance." Several sessions were devoted to the consideration of land and agricultural problems, and included among others the following papers: "Landed Property as an Economic Concept and as a field of Research," by Richard T. Ely; "Two Dimensions of Economic Productivity, with Agricultural Illustrations," by Henry C. Taylor; "The Results of Some Rural Surveys in Iowa," by George H. von Tungeln; "Land Problems and Rural Welfare," by Paul L. Vogt; and "The Rural Credits Law," by C. W. Thompson. In conjunction with the American Statistical Association the significance of statistics regarding the concentration of wealth in the United States was discussed by Profs. Allyn A. Young, W. I. King, and Davis R. Dewey, and Dr. George P. Watkins. The European war was the occasion of a paper by Prof. O. M. W. Sprague of Harvard on "Loans and Taxes in War Finance"; and another by George E. Roberts of the National City Bank on "The Situation of the United States at the Close of the European War with Special Reference to the Gold Supply." Aspects of labor problems were considered in a paper on "Some Phases of the Immediate Wage Question" by J. E. Le Rossignol; and "Legislation vs. Collective Bargaining as a Method of Securing the Regulation of the Hours of Labor" by Prof. George G. Groat. At the special dinner brief addresses as follows were made: "The Place Which Accounting Should Occupy in Any Scheme of National Preparedness," by Edward M. Hurley; "The Price of Securities," by Roger W. Babson; "Immigration," by W. Jett Lauck; "Population," by James A. Field; "The Redistribution of the Labor Now Employed in Pro-

ducing War Supplies," by Mrs. Haviland H. Lund; "Agriculture," by E. Dana Durand; and "Debts and Taxes After the War," by T. S. Adams.

**Bibliography.** Below is given a classified list of some of the more important books published during the year. Additional bibliographies of interest here will be found under AGRICULTURAL CREDIT; ARBITRATION AND CONCILIATION, INDUSTRIAL; CHARITIES; CHILD LABOR; OCCUPATIONAL DISEASES; OLD-AGE PENSIONS; PENSIONS FOR MOTHERS; SOCIAL ECONOMICS; SOCIOLOGY; WOMEN IN INDUSTRY; and WORKMEN'S COMPENSATION.

*General Works:* Henry Clay, *Economics*; E. L. Bogart, *Business Economics*; J. K. Ingram, *History of Political Economy*; G. Juglar and C. W. Thom, *A Brief History of Panics and Their Periodical Occurrence in the United States*; E. S. Mead, *Economics*; Logan G. McPherson, *How the World Makes Its Living*; Edwin G. Nourse (Ed.), *Agricultural Economics*; Dennis H. Robertson, *A Study of Industrial Fluctuation*; J. A. Ryan, *Distributive Justice*; T. N. Carver, *Selected Readings in Rural Economics*.

*Economic History:* E. L. Bogart, *Readings in the Economic History of the United States*; F. C. Howe, *Why War?*; E. Huntington, *Civilization and Climate*; M. Millioud, *The Ruling Caste and Frenzied Trade in Germany*; J. H. Rose, *Nationality in Modern History*; A. H. Sanford, *The Story of Agriculture in the United States*; J. H. Jones, *The Economics of War and Conquest*; V. S. Clark, *History of Manufactures in the United States, 1607-1860*; H. Hauser, *Les Methodes Allemandes d'expansion Economique*; A. M. Wergelund, *History of the Working Class in France*; J. B. Williams, *A Guide to Some Aspects of English Social History, 1750-1850*.

*Money and Banking:* H. Parker Willis, *American Banking*; C. A. Phillips, *Readings in Money and Banking*; H. Withers, *International Finance*; William L. Raymond, *American and Foreign Investment Bonds*; Louis Heft,  *HOLDERS of Railroad Bonds and Notes: Their Rights and Remedies*; Harold G. Moulton, *Principles of Money and Banking*.

*Transportation and Commerce:* Harry G. Brown, *Transportation Rates and Their Regulation*; F. W. Doolittle, *Studies in the Cost of Urban Transportation Service*; M. Ferguson, *State Regulation of Railroads in the South*; Emory R. Johnson, T. W. Van Metre, G. G. Huebner, and D. S. Hanchett, *History of Domestic and Foreign Commerce of the United States*; Robert J. McFall, *Railway Monopoly and Rate Regulation*; L. D. H. Weld, *The Marketing of Farm Products*; Mark Wymond, *Railroad Valuation and Rates*; *Course in Foreign Trade*, a series of 6 vols., issued under the direction of E. E. Pratt, as follows: I. *Economics of World Trade*, by O. P. Austin; II. *The World's Markets. From the Point of View of American Exporters*, by Edward N. Vose; III. *Export Policies*, by E. E. Pratt, E. C. Porter, and P. B. Kennedy; IV. *Export Houses*, by John F. Fowler, C. A. Richards, and Henry A. Talbot; V. *Direct Exporting. Presenting the Problems of the Exporting Manufacturer*, by Walter F. Wyman; VI. *The Export Salesman*, by Paul R. Mahony; T. Farrow and W. W. Crotch, *The Coming Trade War*; E. R. Johnson and G. G.

Huebner, *Shipping in Its Relation to Our Foreign Trade*; J. Russell Smith, *Commerce and Industry*.

**Business Origin and Methods:** John R. Wildman, *Principles of Auditing*; H. F. Adams, *Advertising; Its Mental Laws*; J. M. Harlan and L. W. McCandless, *The Federal Trade Commission*; A. W. Shaw, *An Approach to Business Problems*; R. S. Butler, *Marketing Methods and Salesmanship*; N. A. Brisco, *Fundamentals of Salesmanship*; L. Galloway, *Organization and Management*; F. B. and L. M. Gilbreth, *Fatigue Study*; C. E. Knoeppel, *Industrial Preparedness*; J. Lahy, *Le systeme Taylor et la physiologie du travail professionnel*; J. E. Davies, *Trust Laws and Unfair Competition*; Hastings Lyon, *Corporation Finance*; W. Z. Ripley (Ed.), *Trusts, Pools, and Corporations*; H. L. Gantt, *Industrial Leadership*.

**Labor:** J. R. Commons and J. B. Andrews, *Principles of Labor Legislation*; Charles B. Barnes, *The Longshoremen*; Brassey, *Work and Wages*; G. G. Groat, *An Introduction to the Study of Organized Labor in America*; George Sorel, *Reflections on Violence*, tr. by T. E. Hulme; Annie M. MacLean, *Women Workers and Society*; George M. Janes, *The Control of Strikes in American Trade Unions*; M. Bloomfield and J. H. Willits (Eds.), *Mediation, Investigation, and Arbitration of Industrial Disputes*; W. J. Lauck and E. Sydenstricker, *Conditions of Labor in American Industries*; H. A. Mess, *Casual Labor at the Docks*; The Rand School of Social Science, *The American Labor Year Book, 1916*; Leo Wolman, *The Boycott in American Trade Unions*; W. S. Sanders, *Trade Unionism in Germany*.

**Taxation and Public Finance:** J. C. Stamp, *British Incomes and Property*; Fritz Mender, *Das moderne Zollschutzsystem*; C. Chu, *The Tariff Problem in China*; A. C. Pigou, *The Economy and Finance of the War*; W. Sanders, *The Practice and Law of Excess Profits Duty*; A. N. Young, *The Single Tax Movement in the United States*; E. F. Davies, *The Finances of Great Britain and Germany*; G. R. Salerno, *Scienza della Finanze* (Florence); L. Einandi, *Corso di Scienza della Finanze* (Turin); W. B. Munro, *Principles and Methods of Municipal Administration*.

**POLITICAL PARTIES IN THE UNITED STATES.** See UNITED STATES, *Presidential Campaign*; section *Politics* of the various State articles.

**POLO.** No international polo matches were played during 1916. The United States National Championships were contested at Narragansett Pier, R. I., the junior title being won by the Meadow Brook, 3rd team, comprising F. S. Von Stade, Raymond Belmont, Thomas Hitchcock, Jr., and Morgan Belmont. The contender for the junior honors was the Point Judith four consisting of Philip Stevenson, Rodman Wanamaker, P. S. P. Randolph, Jr., and A. C. Schwartz. The score was 11½ to 2¾.

Meadow Brook defeated Great Neck for the senior championship, the score being 9¾ to 7¾. The Meadow Brook players were: F. S. Von Stade, H. P. Whitney, D. Milburn, and C. C. Rumsey. The Great Neck team was made up of J. Watson Webb, Thomas Hitchcock, Jr., L. E. Stoddard, and Malcolm Stevenson.

In the final match for the inter-circuit championship played at Philadelphia, the Eastern

four—Thomas Hitchcock, Jr., J. Watson Webb, Malcolm Stevenson, and D. Milburn—defeated the Southeastern four—W. S. Stokes, E. L. Stokes, Thomas Stokes, and R. E. Strawbridge—by a score of 15 to 12½.

**POLYNEURITIS.** See VITAMINS.

**POMERENE, ATLEE.** Relected Democratic United States Senator from Ohio, Nov. 7, 1916.

**POMERENE BILL.** See RAILWAYS.

**POOL.** See BILLIARDS AND POOL.

**PORTER, SYDNEY.** See LITERATURE, ENGLISH AND AMERICAN, *Essays, etc.*, American.

**PORT IMPROVEMENT.** See DOCKS AND HARBORS.

**PORTMANTEAU THEATRE.** See DRAMA.

**PORTO RICO. AREA AND POPULATION.** The area of the island is 3435 square miles. The estimated population in 1916 was 1,216,083. The population in 1910 was 1,118,012.

**AGRICULTURE.** The activities of the Board of Commissioners of Agriculture for the betterment of agriculture in Porto Rico were continued during 1915-16. The work of the insular station was extended, and a number of bulletins were issued on important subjects. In addition to the acreage under cane, planting of various fruits and vegetables was made. The regulations regarding the inspection and fumigation of plants to prevent the entrance into Porto Rico of plant diseases and noxious insects were rigorously enforced. Efforts begun in 1915 to secure a market for Porto Rican coffee in the United States were continued, and some progress was made. The chief products of the island are sugar, coffee, tobacco, and fruits. Agriculture is the great basic industry of Porto Rico, and constitutes the source of livelihood of more than four-fifths of its people. The diversity and general upbuilding of agriculture is the fundamental economic task of both the people and the government of the island.

**COMMERCE.** The total value of exports from Porto Rico for the year ending June 30, 1916, was \$66,731,573, the highest total ever recorded, exceeding the figures of 1915 by \$17,374,666. The increase in sugar alone was \$18,530,691, increasing from \$27,278,754 in 1915 to \$45,809,545 in 1916, due to a large increase both in quantity produced and the price. The quantity of sugar exported during the year was 424,956 short tons. The increase in the total exports was more than \$1,000,000 less than the increase in sugar alone, showing that there was a considerable decrease of the total exports of articles other than sugar. Practically all the decrease was in four articles, coffee, pineapples, cigars, and tobacco, which together showed a combined decrease of \$3,236,826. On the other hand there were seven articles which showed an increase in export figures, amounting when combined, to almost \$2,000,000. The most notable of these are molasses, oranges, and straw hats, which show increases varying from 70 to more than 100 per cent over the figures of the preceding year. There was a great decline in the quantity of coffee produced, which fell from 51,125,630 pounds in 1915 to 32,144,283 pounds in 1916, a decrease of about 37 per cent.

The value of imports from the United States was \$38,951,156 in 1915, compared with \$33,884,296 in 1914. Imports from the United States gained in value \$4,962,684, and amounted to \$35,892,515. For the first time in the history of the island the total external trade ex-

ceeded \$100,000,000, reaching the large sum of \$105,682,729.

**EDUCATION.** There were in the island in 1916, 419,599 persons of legal school age. Of these 151,562 or 35.8 per cent were enrolled in the public schools. Of the entire school population 79 per cent live in rural communities and of these only 26 per cent were enrolled in the public schools. In the urban centres 72.5 per cent of the children of legal school age were enrolled. Teachers numbered 2488 of whom 2296 were Porto Ricans. The public schools were conducted in 1506 different school buildings. During the year 59 new sites for school buildings were acquired, and 83 new school buildings were completed or in process of construction. The total expenditures for educational purposes were \$1,840,016. Great efforts were made during the year by the commissioner of education to increase the general efficiency of the work in his department, especially throughout the rural districts. Some progress was made in the development of prevocational and industrial education, with promising results, considering the limited amount of sums available for the purpose. The legislature of 1916 provided for the establishment of 275 additional rural schools.

**HEALTH AND SANITATION.** The work of sanitary survey of watersheds was continued during the year. New water works systems were completed in a number of municipalities, and the construction or reconstruction of others is in progress. Attention and study also were given to the matter of filtration of water, and its sterilization. There was an epidemic of smallpox in May, June, and July of 1916. Notwithstanding this the mortality was not sufficient to affect the general mortality rate. The insular board of health prepared a number of rules and regulations relative to sanitation in dwellings and places of business. Studies of tropical medicine and hygiene were continued during the year, and much valuable work was accomplished.

**FINANCE.** For the fiscal year 1916-17, the general property tax on the island increased by one-fourth of 1 per cent, all the increase to go into the insular treasury. This will add about \$450,000 for the revenue for that year. The receipts for the fiscal year amounted to \$9,142,352. There was a balance at the beginning of the year of \$2,672,495. The total expenditures were \$5,776,924. The balance at the end of the year was \$6,037,923. Two issues of bonds, one of \$2,000,000, and the other of \$1,000,000, were authorized during the year. The first was for public improvements, and the second for the establishment of an agricultural bank.

**CHARITIES AND CORRECTIONS.** These include the Blind Asylum, the Girls' Charity School and the Boys' Charity School, and the Insane Asylum. Provision has been made for the erection of a new building for the insane asylum but this has been delayed. In the penal institutions there were committed during the year 5776 prisoners. The juvenile court act which took effect on July 1, 1915, is proving of great benefit to delinquent minors. In the reform school for boys agricultural training is carried on.

**LEGISLATION.** The second session of the eighth legislature convened on February 14th, and adjourned on April 13, 1916. During the session there were passed 80 laws and 23 joint resolutions, all of which were approved by the

government. Among the measures passed were those relating to revenue and taxation. Of special importance was the law for the relief of workmen injured in their trade or occupation. In addition to these there was passed an act for the standardization of government supplies and a centralization of purchases by the government. There were also passed several amendments to the school law, to the penal code, and to the license code. A bill providing for citizenship of the Porto Ricans was introduced into the 64th Congress. On May 23rd the House of Representatives struck from the bill an amendment designed to create woman suffrage in the island. The vote was 80 to 59. The bill was then passed virtually as it was introduced. A measure gives to the Porto Rican government all its internal revenue regardless whether the goods on which the revenue was paid are used in Porto Rico or the United States. Hitherto a revenue on goods used in the United States has gone to the Federal treasury. Additional qualifications were provided for applicants for citizenship under the measure. The employment of children under 14 years of age in injurious or dangerous occupations is prohibited. The measure went to the Senate, where no action was taken at the end of the year.

The Governor in 1916 was Arthur N. Yager.

**PORTUGAL.** A European republic (since 1910), occupying the western coast of the Iberian Peninsula. The capital is Lisbon.

**AREA AND POPULATION.** The area by districts and the results of the census of December, 1911, compared with that of 1900, with density per square kilometer in 1911, are shown in the following table:

	Sq km.	1900	1911	D.
Aveiro .....	2,758	303,169	386,243	116
Beja .....	10,255	183,612	192,499	19
Braga .....	2,698	357,159	382,276	142
Bragança .....	6,510	185,182	192,024	29
Castelo Branco	6,688	216,608	241,184	86
Coimbra .....	3,907	332,168	359,387	92
Evora .....	7,400	128,062	148,295	20
Faro .....	5,019	255,191	272,861	54
Guarda .....	5,482	261,630	271,616	49
Leiria .....	3,412	288,755	262,632	77
Lisbon .....	7,941	709,509	852,854	107
Portalegre .....	6,231	124,431	141,481	23
Porto .....	2,312	697,985	679,540	294
Santarém .....	6,619	283,154	325,775	49
Viana do Castelo	2,221	215,267	227,250	102
Vila Real .....	4,273	242,196	245,547	57
Viseu .....	5,019	402,259	416,744	82
Total .....	88,740	5,016,267	5,547,708	62
Azores .....	2,388	256,691	242,565	101
Madeira .....	815	158,574	169,783	208
Republic ...	91,943	5,423,132	5,960,056	65

Of the total population in 1911, 2,823,691 were males and 3,131,365 females. Foreigners in the country numbered 41,197, of whom 20,517 were Spaniards and 12,143 Brazilians. The principal towns, with their population in 1911, were: Lisbon, 435,359; Oporto, 194,009; Setúbal, 30,346; Funchal (Madeira), 24,687; Braga, 24,647; Coimbra, 20,581; Evora, 17,911; Ponta Delgada (Azores), 16,179; Covilhão, 15,745; Faro, 12,680; Tavira, 11,665; Portalegre, 11,603; Aveiro, 11,523; Elvas, 10,645; Viana do Castelo, 10,486; Beja, 10,113; Angra do Heroísmo (Azores), 10,067; Silves, 9919; Santarém, 9897; Lagos, 8167; Castel Branco, 7798. Births

in 1913 numbered 199,765, deaths 124,748, marriages 39,950, emigrants 77,633 (chiefly to Brazil and the United States).

**PRODUCTION.** Agriculture engages three-fifths of the population. Crops and pasture occupy 26.2 per cent of the total area; vineyards, 3.5; orchards, 3.9; forest, 17.3; 43.1 per cent is barren or uncultivable. The production of wheat in 1914-15 was 6,367,968 bushels. Complete production figures are unavailable. In the highlands cereals, flax, hemp, and vines are grown; the products of the lowlands are rice, olives, almonds, figs, and citrous fruits. Live stock is raised. The mineral output is important. Output of sulphur in 1912, 339,096 metric tons; copper, 905; copper precipitate, 5582; cupreous pyrites, 8843; iron, 29,413; arsenic, 941; anthracite, 15,366; silver ore, 4646; uranium, 850; wolfram, 982. Salt, marble, gypsum, and lime are worked. The manufactured products are gloves, silks, woollens, linens, cottons, metal and metal wares, tobacco, cigars, etc. The value of the fisheries products in 1914 was £1,480,513 (sardines, £707,909).

**COMMERCE AND COMMUNICATIONS.** The special trade is shown in contos (1 conto = 1000 milreis) for three years: A = raw materials, B = foodstuffs, C = yarns and textiles, D = machinery, implements, etc., E = miscellaneous manufactures, F = live animals, G = tare, C and B = coin and bullion, and includes all precious metals.

	Imports			Exports		
	1911	1912	1913	1911	1912	1913
A .....	32,498	33,688	35,906	7,140	7,897	8,824
B .....	12,805	17,020	25,231	19,044	19,776	19,284
C .....	7,682	7,977	8,108	1,522	1,172	1,280
D .....	5,900	6,916	7,541	2,277	2,294	2,345
E .....	6,077	6,891	10,056	139	145	185
F .....	3,032	2,515	1,975	3,943	3,041	3,418
G .....	137	132	166	.....	.....	.....
Mdse. . . . .	68,127	74,689	88,978	34,065	34,325	35,286
C. & B. . . . .	1,072	963	.....	641	1,398	.....
<b>Total.</b> . . . . .	<b>68,127</b>	<b>75,712</b>	<b>89,941</b>	<b>34,065</b>	<b>34,966</b>	<b>36,684</b>

The principal articles of export in 1913, with values in thousands of milreis, were wine, 12,163; cork, 4209; animals, 3418; fish, 3110; tropical fruits, 1111; timber, 1133; copper, 1185; olive oil, 519. The principal countries of origin and destination (values in thousands of milreis), were the United Kingdom with imports, 23,490, and exports, 7601; Germany, 15,840 and 3407; United States, 9892 and 1225; Belgium, 4049 and 1110; France, 7594 and 1334; Spain, 3845 and 5479; Portuguese colonies, 2847 and 4944; Brazil, 1651 and 6193; Netherlands, 1789 and 710; Italy, 1816 and 579; Norway, 2180 and 207. Vessels entered in the 1913 trade, 10,638 of 24,568,120 tons. Merchant marine (1911), 66 steamers, of 70,193 tons, and 259 sail, of 43,844.

Railways in operation Dec. 31, 1913, 1840 miles (711 state-owned). Telegraph lines (1912), 5945 miles; wires, 13,415. Post offices (1913), 4266.

**FINANCE.** The monetary unit is the escude, which has the same value as the milreis (\$1.08046), but is divided into 100 centavos, whereas the milreis represented 1000 reis. The centavo equals 10 reis. The table below gives revenue and expenditure for comparative years (budget estimates):

	1913-14	1914-15	1915-16
Revenue .....	75,894,000	83,390,965	78,043,630
Expenditure .....	74,915,000	79,669,140	88,645,951

A British authority states the debt June 30, 1915, as follows: £38,996,374 external, £134,183,128 internal.

**NAVY.** See NAVAL PROGRESS.

**GOVERNMENT.** The republic was proclaimed Oct. 5, 1910, and sanctioned by the national assembly Aug. 21, 1911. The constitution of Aug. 21, 1911, provides for a president (1915-19, Bernardino Machado), to be elected every four years by the congress. He is not eligible for reelection. He appoints his ministers, who are responsible to the parliament. This body is composed of a senate of 71 members elected for six years, and a chamber of deputies directly elected for three years.

**HISTORY**

**PORTUGAL'S ENTRY INTO THE WAR.** On the outbreak of the war Portugal made it known that she would be faithful to her treaty obligations to Great Britain and would aid the Allies whenever she was called upon to do so. The treaty with Great Britain bound her to supply the latter with 10,000 troops when the latter required them. Great Britain made no demand for them but early in 1916 urged the Portuguese government to requisition certain German ships interned in Portuguese waters. On February 24th the Portuguese government took possession of 36 Austrian and German merchantmen in the Tagus and the next day of 8 German steamships at St. Vincent, Cape Verde Islands, declaring, however, that it was not an act of war but a measure of public interest, and offering the payment of compensation. Germany immediately demanded their restoration and, upon Portugal's refusal, declared war (March 9th). The reasons given by Germany for this action were the repeated breaches of neutrality by Portugal, for example, free passage of British troops through Mozambique, collisions between Portuguese and German troops on the southwest African and Angola frontiers, unfair permission to British vessels to use Portuguese ports and to use Madeira as a naval base, insults to Germany by Portuguese deputies, etc. On March 10th the cabinet resigned to give place to a national defense government which was announced on March 15th. Antonio Almeida was Premier. Parliament had voted the government necessary powers for carrying on the war. In an interview published on April 11th, President Machado was recorded as saying that the government was doing all in its power to aid in the prosecution of the war, and that it had requisitioned the ships that were interned in its ports to be used for warlike or commercial purpose in accordance with the necessity of the Allies. He said that the war had led the government to determine to put an end forever to the policy of isolation which had hitherto been followed. The aloofness of Portugal in the past had allowed Germany to gain advantages at the expense of England. It was announced on April 18th that the government had decreed the expulsion of all Germans over military age, the internment of the others, and the sequestration of German

property. Great activity was reported during the summer in the Portuguese navy, a number of vessels being repaired and efforts being made to find crews for others. On April 11th the ministry resigned on account of differences over the question of amnesty for political offenders.

**INTERNAL CONDITIONS.** In January the total expenditures caused by the European war were placed at \$105,000,000. The budget on January 13th showed a deficit of \$3,000,000. In February there were several casualties in Lisbon occasioned by strikes and food riots. On December 13th there were disorders at several points throughout the country. The soldiers in the garrisons at Castelobranco and Abrantès mutinied and were promptly arrested. A still more serious movement appeared at Thomar, but after the intervention of the loyal troops, order was soon restored. Vigorous measures were taken at Lisbon to maintain order, and it was reported toward the end of the month that there was no further difficulty. Precise information on the subject could not be had, but according to the governmental authorities the movement was of no importance. The head of it was an ex-officer of the navy named Machado dos Santos, who had taken part in the overthrow of the monarchy, but who had continued to disturb the new government. He started out from Thomar with 300 soldiers in the direction of Abrantès, but was arrested. Many of his companions had already left him and the rest surrendered.

The Prime Minister made a report to Parliament on these events and said that the trouble was over. The causes of the uprising were in general the discontent among the Conservatives and Monarchists occasioned by Portugal's participation in the war. They had opposed this from the first, and arguments failing, had resorted to seditious means in which, according to their opponents, German money and aid had played a part. It was said that the Monarchists in Portugal, with few exceptions, sympathized with these movements. They were accused by the friends of the government of carrying on a campaign of false reports and trying to demoralize the *morale* of the troops. It was alleged that the well known Couceiro, who for several years past as the chief of the Royalist absentees had tried to invade the north of Portugal, was involved in this movement, despite the fact that the ex-King Manuel had formally commanded his loyal supporters not to embarrass the government in its policy of making war on the side of the Allies. They addressed circulars to their fellow Catholics everywhere, and in one of them, published in the *Seculo*, appealed to them on the ground of the danger to Portugal's relations with Spain and the damage and loss of life that would result to the country. See **WAR OF THE NATIONS.**

**PORTUGUESE EAST AFRICA** (MOZAMBIQUE). A Portuguese colony in Africa, covering 293,860 square miles and having about 3,120,000 inhabitants. Capital, Lourenço Marques.

**PORTUGUESE GUINEA.** A Portuguese West African colony, covering 13,490 square miles and having about 820,000 inhabitants.

**POST, AERIAL.** See **AERONAUTICS.**

**POSTAL SAVINGS BANKS.** See **SAVINGS BANKS.**

**POTASH.** See **FERTILIZERS.**

**POTASSIUM.** See **CHEMISTRY, INDUSTRIAL.**

**POTATOES.** Although data with reference to the world's potato production in 1916 were very incomplete, they indicated nevertheless that the yield was smaller than in 1915. The crop in Great Britain was reported below the average as a result mainly of disease attacks, and in France, which ranks high as a potato producing country, the total production was also under normal, due mainly to the inability of properly caring for the crop, as the area, 3,225,000 acres, was larger by several thousand acres than in 1915. The average yield in France, where only about 3 per cent of the acreage produces potatoes for industrial purposes, is about 130 bushels per acre. Germany, the leading potato producing country of the world, produces an average of approximately 220 bushels per acre, but a large percentage of the annual area, over 8,000,000 acres, produces tubers used in the industries, about 80 per cent of the entire output of over 100,000,000 gallons of alcohol being derived from potatoes. For Russia, which leads all countries in acreage, no recent data on production were available. The yield of Rumania was reported as almost one-fourth greater than in 1915 and about one-third greater than the average for the five years 1909-1913. The crop of Bermuda was normal and of good quality. Two crops are harvested there each year, one in April and May and the other from November to January. In 1916 the first shipment from the late crop to the United States sailed on November 25th, consisted of 371 barrels, and brought \$1781. About 8000 barrels of Bliss Triumph seed potatoes were imported by Bermuda from Long Island as compared with about 6000 barrels in 1915. Canada reported a lower production than in the preceding year as a result of unfavorable seasonal conditions, and an acreage reduction from 479,000 to 449,000 acres. In the Province of Ontario the average yield per acre was estimated at only 53 bushels as against 76 in 1915.

The production of the United States, as estimated by the Department of Agriculture, was 285,437,000 bushels, produced on 3,550,000 acres at the rate of 80.4 bushels per acre. The corresponding figures were respectively 359,721,000 bushels, 3,734,000 acres, and 96.3 bushels for 1915, and 360,772,000 bushels, 3,686,000 acres, and 97.9 bushels for the five years 1910-1914. The farm value on Dec. 1, 1916, was 146.1 cents per bushel and the total crop value on this basis \$417,063,000, both figures being the highest ever recorded. The value per acre on the basis of the December 1st price was \$117.48. The average farm value on Dec. 1, 1915, was 61.7 per bushel and for the five preceding years as of the same date, 59.2 cents. The leading States and their yields in 1916 were as follows: Maine, 25,000,000; New York, 22,400,000; Pennsylvania, 19,040,000; Minnesota, 16,800,000; Virginia, 16,250,000; Michigan, 15,360,000; Wisconsin, 13,630,000; California, 10,575,000, and New Jersey, 10,370,000 bushels. The highest average yield, 204 bushels per acre, was secured in Maine. It is estimated that for the five-year period 1910-1914, the annual supply of potatoes in the United States was about 363,300,000 bushels or over 3.5 bushels per capita. About 70 per cent of the crop in the United States is harvested in September and October and about 32

per cent of the crop is moved from the county in which it is produced. See **HORTICULTURE**.

**POWER, TRANSMISSION OF.** See **ELECTRIC POWER, TRANSMISSION OF.**

**POWER FROM VOLCANIC HEAT.** See **VOLCANOES.**

**POWYS, JOHN COWPER.** See **LITERATURE, ENGLISH AND AMERICAN, Poetry, English.**

**PRAGMATISM.** See **PHILOSOPHY.**

**PRATT, SILAS GAMALIEL.** An American composer, died in Pittsburgh, Pa., Oct. 30, 1916. He was born in Addison, Vt., in 1846, and was educated in music under American teachers until he was 22 years old, when he went to Berlin to study the piano under Bendel and Kullak and composition under Kiel. Afterward he studied score reading with Dorn. He organized the Apollo Club of Chicago in 1872. Removing to New York in 1890, he became professor of the piano in the New York Metropolitan Conservatory, and in 1906 went to Pittsburgh, where he established the Pratt Institute of Music and Art. He arranged and conducted many musical festivals and often gave concerts of his own composition both in the United States and Europe. As a composer he favored the larger forms. His works include three operas, *Zenobia* (1882), *Lucille* (1887), and *The Triumph of Columbus* (1893); three symphonies; two symphonic poems, *Sandalphon* and *A Tragedy of the Deep* (in commemoration of the *Titanic* sinking); *A Centennial Overture*; a festival overture, *The Voyage of Columbus*; a suite for orchestra, *The Tempest*; songs and piano pieces.

**PRATT INSTITUTE.** A non-sectarian co-educational institution in Brooklyn, N. Y. There were 3341 students enrolled in all departments in the fall of 1916. The faculty numbered 203. In the library were 112,200 volumes. President, Charles Millard Pratt.

**PRECIOUS STONES.** See **GEMS AND PRECIOUS STONES.**

**PRE-COLUMBIAN CIVILIZATION.** See **ANTHROPOLOGY.**

**PREFERENTIAL VOTING.** See **ELECTORAL REFORM.**

**PREPAREDNESS.** See **MILITARY PROGRESS; NAVAL PROGRESS; UNITED STATES; UNITED STATES AND THE WAR.**

**PRESBYTERIAN CHURCH.** The total number of Presbyterian church members in the United States in 1916 was 2,708,968; the number of adherents was 5,000,000. There are four large and several smaller denominations under the Presbyterian system. The largest is the Presbyterian Church of the United States of America, known as the Northern Presbyterians, with 1,560,009 communicants (an increase of 64,852 over 1915), 9953 churches, and 9739 ministers. The Presbyterian Church of the United States, known as the Southern Presbyterians, in 1916 had 348,223 communicants, 3437 churches, and 1861 ministers. Other Presbyterian churches, which are treated under their own titles, are the Cumberland Presbyterian Church, the United Presbyterian Church, and Reformed Presbyterians (including several branches in the North and South). A very small body is the Associated Presbyterian denomination, numbering in 1916 500 communicants, 14 churches, and 9 ministers.

The Northern Presbyterian Church, officially known as the Presbyterian Church of the United

States of America, is divided into 40 synods, with 291 presbyteries. The Sunday school scholars in 1916 numbered 1,427,208, an increase of 40,094 over 1915. The total contributions for all purposes were \$28,122,426, an increase of \$337,390 over 1915. Of the total contributions in 1916 \$20,101,322 was for congregational purposes, \$2,000,614 for home missions, \$1,738,025 for foreign missions, and \$467,914 for colleges. The general assembly is the chief governing body of the church. The missionary work is carried on under the control of the board of foreign missions and the board of home missions. In 1916 there were 27 foreign missions, 162 stations, 1330 missionaries, 6097 native helpers, 914 fully organized churches, 148,688 communicants, 1857 schools, 74,763 pupils, 176,168 pupils in Sabbath schools, 172 hospitals and dispensaries, 991,416 patients treated annually. The number of pupils, schools, and hospital patients is given as fully as is compatible with different war conditions. The board of education controls the educational work of the denomination, and provides pastoral care and religious instruction for students in State universities and State colleges. The denomination has 12 theological seminaries, with 840 students in 1916, of whom 192 graduated, and 66 colleges and universities, with 26,268 students. Other important boards are the board of publication and Sunday school work, the board of church erection, and the board of ministerial relief and sustentation.

During the sessions of the general assembly of 1916, of which Rev. John Abner Marquis was moderator, some of the acts passed were these: Refusing to trustees of anti-saloon league election or approval by synods; reaffirming the doctrine of deliverance of 1910 as to the following points: inerrancy of the Scriptures, virgin birth of Jesus Christ, vicarious atonement of Jesus Christ, bodily resurrection of Jesus Christ and the actuality of His miracles; changing the name of the Presbyterian Brotherhood to Permanent Committee on Men's Work; urging public officials to enforce Sabbath law, especially against motion picture houses; approving bill for national prohibition; disapproving the use of tobacco by ministers and other office bearers. See also **RELIGIOUS DENOMINATIONS AND MOVEMENTS.**

**PRESIDENTIAL CAMPAIGN, UNITED STATES.** See **UNITED STATES, Presidential Campaign.**

**PRÉVOST, MARCEL.** See **FRENCH LITERATURE, Novels.**

**PRICES.** One of the most important economic changes of the year was the upward movement of prices in general and the very sharp rise in the prices of food products. These movements affected all parts of the world, and were everywhere followed by governmental and private efforts to combat them. Early in the year Germany carried one step farther her administrative measures for the regulation of food supplies, their distribution, and their prices. Towards the close of the year Great Britain also created a "food dictator." All other belligerent nations and neutral countries of Europe and South America attempted by changes in import and export regulations and by numerous measures of internal regulation to check the tendency toward higher prices of food products.

In the United States the question of high

food prices became a factor in the presidential campaign; the increased cost of living gave a stimulus to the formation of coöperative societies; and in the later months of the year there were extensive, though loosely organized, boycotts against eggs, poultry, and meat products. In New York a group of 300 women representing Socialist organizations marched to the City Hall to demand that the mayor use public authority in reducing food prices and perfecting food distribution. In December it was announced that a national conference of producers, farmers' organizations, and consumers' leagues had been called to meet in New York in April, 1917, to consider methods of eliminating middlemen's profits and bringing producer and consumer together. Public mass meetings were held in Faneuil Hall, Boston, and in numerous other cities. On the first day that Congress assembled, 11 bills and resolutions dealing with the high cost of living were introduced in the House. Various of these bills dealt with a proposed embargo on the exportation of farm products or manufactured food products. Others authorized a reduction of parcel post rates on food products; prohibited the shipment in interstate commerce of food products, except butter stored for more than 10 months, and required the branding of all cold storage articles with the date of their admission. A committee of the American Federation of Labor interviewed President Wilson, who promised to endeavor to secure speedy action from Congress. It was expected that the President would make this question the subject of a special address to Congress. Meanwhile Secretary of Commerce Redfield had begun the collection of data relating to the differences in prices paid to producers and those paid by consumers. Moreover, Attorney-General Gregory had ordered grand jury investigations in New York and Detroit with the prospect of similar investigations in other large cities. These investigations were under the direction of United States District Attorney George W. Anderson of Boston and were expected to relate particularly to combinations of dealers in food products. It was announced late in December that a result of these inquiries would be the indictment of large coal dealers on charges of extortion and retardation of shipment in order to create public alarm.

Throughout the year prices of eggs ranged materially higher than in preceding years. At New York City, for example, the wholesale prices of New York State fresh eggs on different dates were as follows: Aug. 15, 1914, 26 cents; Jan. 1, 1916, 36 cents; September 1st, 34 cents; October 1st, 38 cents; November 1st, 42 cents; December 1st, 45 cents; Jan. 1, 1917, 48 cents. Retail prices ranged materially higher, especially in the later months of the year when throughout the East they remained steadily in the region of 65 cents per dozen. This led to boycotting movements by housewives' leagues, but with slight effect on prices. Investigations disclosed the fact that the number of eggs in cold storage was markedly less than in previous years, due primarily to a great increase in exportation to Europe.

**AMERICAN INDEX.** While commodity prices had advanced before the close of 1915 so as to impress the average consumer that at least food prices were perceptibly increasing, nevertheless any advance from the beginning of the war to the close of 1915 was almost negligible in com-

parison with the unprecedented rapidity and amount of advance during 1916. The advance was most marked in food prices. Thus *The Economist* index number showing the changes in the average wholesale price of 25 food products so selected as to represent an average family budget, advanced from 148.939 on Dec. 11, 1915, to 208.038 on Dec. 9, 1916. This was an advance of 40 per cent in the general level of food prices for the year. *Bradstreet's* index number giving the aggregate prices per pound of 96 different articles, including all kinds of food products, 13 metals, 11 chemicals and drugs, 7 building materials, and numerous other articles, stood at \$9.0354 on Dec. 1, 1914. One year later it was \$10.6473. On the first day of each month in 1916 this index was as follows: January, \$10.9163; February, \$11.1415; March, \$11.3760; April, \$11.7598; May, \$11.7485; June, \$11.6887; July, \$11.5294; August, \$11.4414; September, \$11.7803; October, \$12.0399; November, \$12.7971; and December, \$13.6805. These figures should be compared with the following average indexes for certain preceding years: 1896, \$5.9124; 1900, \$7.8839; 1905, \$8.0987; 1906, 8.4176; 1907, \$8.9045; 1910, \$8.9881; and 1912, \$9.1867. During 1916 the only groups of articles showing a decline in prices were naval stores and chemicals and drugs. The advance in breadstuffs was 60 per cent; in fruits, 50 per cent; and striking advances were made in metals, oils, hides and leather, textiles, coal, and coke. This index on Nov. 1, 1916, was 116 per cent greater than the low level for the year 1896; it represented an advance in the general level of prices of 2 per cent since 1900, of 42 per cent since 1910, and of 23 per cent since Nov. 1, 1915.

**GREAT BRITAIN.** A departmental committee under the chairmanship of J. M. Robertson, M.P., was appointed by the Board of Trade to investigate the causes of price increases and to recommend steps for relieving the situation. A preliminary report of this committee reviewed the movement of prices, wages, and employment from 1914 to 1916 and drew the conclusion that on the whole "there is less total distress in the country than in an ordinary year of peace, the majority of the classes which chronically suffer from distress being in unusually regular employment" at advanced wages. On the other hand, it pointed out that certain classes of workers who usually are regularly employed, such as cotton operatives and salaried persons, were suffering much from higher price levels. After reviewing the supplies of meat, milk, and bacon, the committee recommended that there be increased construction of vessels, especially for refrigerated meat; that the congestion on docks and railways be relieved by increased labor forces; that the government further restrict the importation of less necessary commodities; that the government exercise increased control over slaughtering; that the prohibitions on the importation of live cattle from Canada be relaxed; that the government extend its services in the purchase of meat and the disposal of it to the civil population; that the consumption of meat by all not engaged in manual labor be restricted; that the government aid the establishment of refrigerating plants at South American ports; that numerous measures be taken to regulate the milk supply, including particular attention to the establishment of maternity centres, baby



clinics, and child nurseries; and that all civil authorities consider the possibility of increasing the wages of women and the lower paid employees.

The statistics of the *Labour Gazette* showed that during the year ending Sept. 30, 1916, retail food prices advanced 20 per cent, making a total advance from July, 1914, of 68 per cent. The advance in large towns was 71 per cent and in small towns and villages 66 per cent. From the beginning of the war the prices of bacon, flour, sugar, eggs, and various meat products had more than doubled. It was estimated that the cost of living, including food, rent, clothing, fuel, light, and miscellaneous items, had increased 50 per cent from July, 1914, to Oct. 1, 1916.

Near the end of November the British government entered upon a policy of rather extensive food control. This policy was adopted in view of the soaring prices and especially on account of the harvest shortage in Canada and the United States. The Board of Trade was given very wide powers for the accomplishment of the following objects: to prevent waste; to restrict the use of any article; to regulate the manufacture and production of articles; to direct their sale and distribution; to regulate market operations so as to prevent price inflations; to fix maximum prices; to require owners of supplies to place them at the disposal of the board; to make a careful census of all available supplies; and to enter premises where articles are kept, stored, manufactured, or produced. It was expected that numerous measures designed to restrict luxurious living would be adopted. The first orders limited the retail price of milk to 2d. per quart above the price in the corresponding month before the war, virtually fixing 6d. per quart as the maximum; and established standard percentages of flour that must be extracted from the various grades of wheat.

**STATE COMMISSIONS.** About the 1st of December Governor McCall of Massachusetts appointed the following to constitute a High Cost of Living Commission to investigate and make public its findings regarding higher prices: James J. Storrow, a prominent business man; Francis X. Tyrell, chairman of the former State Board of Economy and Efficiency; Prof. Melvin T. Copeland of Harvard University; and Robert Luce, and Edward F. McSweeney, both members of a former similar commission. On December 27th this Commission issued a published report dealing with the coal situation. It favored Federal regulation of the mining and transportation of anthracite coal and State regulation of its sale. It recommended that Federal authority should supervise the distribution of coal cars, and fix the maximum price at the mines; and that the anthracite coal business should be completely separated from railroad control. While the report exempted local dealers for the most part from any charge of extortion it recommended that the Legislature should give the Gas and Electric Light Commission authority to license coal and coke dealers; and favored a law compelling such dealers to sell coal in 25 pound lots at the ton rate, and to require gas companies to give preference to coke orders of 100 pounds or less.

In New York on December 31st was issued a joint report by a Market Commission appointed

by Governor Whitman, a Food and Market Committee appointed by Mayor Mitchel, and the Weeks Legislative Committee. This recommended the creation of State, city, interstate, and local commissioners of markets to check waste and excessive profits in food handling, cheapen transportation and marketing, and educate farmers in buying and consumers in selling. It strongly favored the formation of food producers into coöperative selling and distributing societies. This would, for example in the milk supply, eliminate the costs of getting business and the duplication of delivery routes. Among the causes of higher prices this report mentioned the war and the consequent increase in exports of food (\$172,000,000 in the first nine months of 1914 and \$337,000,000 in the same months of 1916); decreased production in some lines; ignorance and extravagance of housewives; and expensive methods of retail distribution. See **NEW YORK.**

**CENTRAL POWERS.** Reports regarding the level of prices and the condition of the food supply in Germany and Austria were very conflicting. While one report would seem to indicate that large portions of the population were on the verge of starvation others indicated that there was an adequate supply of fundamental foods at prices within public reach. Investigations made by university professors in Germany regarding the growth and weight of children were reported to indicate that although weights averaged slightly below normal there were no evidences of injury to growth. In both Germany and Austria centralized control of food supplies and their distribution was carried to the highest degree of completeness. In Austria-Hungary on December 23rd was promulgated a law prohibiting the importation of all articles of luxury, including fruits, wines, chocolate, silk, furs, toys, jewelry, musical instruments, and perfumery. One object of this law was to check the decline in exchange rates. Calculations based on the normal family food budget seemed to indicate that in Berlin prices were about 125 per cent higher than in July, 1914, while in Vienna they were 178 per cent higher. Hungarian papers asserted that food prices had more than doubled and that starvation was a real danger. It was known that in all of these countries there was an almost complete absence of fats and that some other foods had practically disappeared. See **AUSTRIA-HUNGARY and GERMANY, History.**

**OTHER COUNTRIES.** According to calculations reported in the *Monthly Review* of the Bureau of Labor Statistics in November the increase in prices in various countries up to certain months of 1916 was as follows, the general average of prices for 1913 being equal to 100: Australia, April, 143.6; Canada, August, 117.6; France, February, 132.3; Italy, May, 128.9; Netherlands, June, 147.4; New Zealand, July, 123; Norway, June, 172.8; and Sweden, June, 136.9.

**PRIMARY, DIRECT.** See **ELECTORAL REFORM.**

**PRINCE EDWARD ISLAND.** One of the Maritime Provinces of Canada, the smallest in the Dominion. The island lies east of New Brunswick and north of Nova Scotia. Area, 2184 square miles. The capital is Charlottetown. Between 1901 and 1911 the population decreased 9.23 per cent, or from 103,259 to 93,728. In 1911 Charlottetown had 11,198 inhabitants; Summerside, 2678; Souris, 1089. Of the

population 10 years of age and over in 1911, 36,832 (50.02 per cent) were males, and 36,796 (49.98) females; of these, 27,956 males and 3950 females were reported as employed in gainful occupations. Of the males employed, 68.4 per cent were in agriculture (the highest percentage in the Dominion), 6.5 in manufacturing, and 6.2 in building trades; of the females, 39.5 per cent were in personal and domestic service, 18.9 in manufacturing, 16.6 professional, 14.7 in agriculture, and 8.6 in trade and merchandising.

The provincial government is administered by a lieutenant-governor, appointed for five years by the Governor-General of the Dominion; he acts through an executive council, or responsible ministry. The Legislative Assembly is a single chamber of 30 members, elected for four years, half of them by real-property holders and half by manhood suffrage. In the 12th Parliament, which convened in 1911, the province was represented by four Senators and four members of the House of Commons; the representation in the Commons on the basis of the 1911 census is three. The Lieutenant-Governor in 1916 was Augustine Colin Macdonald, appointed June 2, 1915, in succession to Benjamin Rogers.

**PRINCETON UNIVERSITY.** A non-sectarian institution for the education of men, founded in 1746. In the fall of 1916 the total enrollment of students was 1555 and the faculty numbered 199. The following are the more important additions made to the faculty during the year: Dr. Charles Carroll Marden, Emory L. Ford professor of Spanish; Capt. Stewart Heintzelman, U. S. A., detailed by the War Department as professor of military science and tactics; Dr. John Bauer, assistant professor, preceptor in economics and social institutions; Dr. Henry B. Dewing, assistant professor, preceptor in classics; Dr. Horace Craig Longwell, assistant professor, preceptor in philosophy; and Dr. Norman Brown Tooker, assistant professor of hygiene and physical education. The university library contains 383,700 volumes. It was expected that the new dining halls, erected at a cost of \$500,000 (one-half of which amount was given by Mrs. Russell Sage and the other half by alumni and others), would be entirely completed during the academic year 1916-17. At the end of 1916 portions of the halls were already in use. During the year William W. Lawrence left his estate of \$1,000,000 to the university; Emory L. Ford, of the class of 1896, gave \$100,000 to endow a professorship in Spanish; and Henry C. Frick presented to the university a fine pipe organ which was erected in the Procter Dining Hall of the Graduate College. Mr. Frick also gave \$100,000 to endow the organ, together with a chair in the history and theory of music. Mrs. Marie A. Fisk bequeathed about \$115,000 for dormitory construction purposes, and Edward Plaut established the Albert Plaut Memorial Library of Chemistry. Plans were made for a new Athletic Field, to be called Poe Field. The president of the university is John Grier Hibben.

**PRISON ASSOCIATION, AMERICAN.** See **PENOLOGY.**

**PRISON REFORM.** See **PENOLOGY.**

**PRISONS.** See **PENOLOGY.**

**PRIX GONCOURT.** See **FRENCH LITERATURE.**

**PRIX LASSEBEE.** See **FRENCH LITERATURE, Literary Events.**

**PROBATION.** See **PENOLOGY.**

**PROFESSORS, AMERICAN ASSOCIATION OF UNIVERSITY.** See **UNIVERSITIES AND COLLEGES, Pensions for College Teachers.**

**PROFIT SHARING.** See **LABOR.**

**PROHIBITION.** See **LIQUOR REGULATION; LIQUORS.**

**PROSTITUTION.** The active campaign against prostitution which has been carried on during recent years in the United States continued in all parts of the country during 1916. This movement has taken on the broad character of a public health or social hygiene movement and consequently has enlisted the active support not merely of moralists but of medical associations and numerous societies for social and moral prophylaxis. In New York City the most active work is done by the Bureau of Social Hygiene (q.v.). In the country at large the most important organization is the American Social Hygiene Association which publishes a monthly *Bulletin* and a quarterly, *Social Hygiene*, of which the second volume appeared in 1916. Its branches in many of the leading States are active centres of local agitation. Those in Connecticut, Illinois, Massachusetts, New York, and Oregon have been notably effective. In consequence of the enactment in 1912 of the Mann White Slave Act forbidding any transportation of women for immoral purposes from one State to another there have been enacted similar laws by State Legislatures applying to similar transportation within their own boundaries. But the most important laws of the States have been the injunction and abatement laws which in various ways provide for the punishment of owners of property used in connection with social vice. Such laws are now in operation in at least 23 States.

**SOCIAL HYGIENE.** The annual meeting of the American Social Hygiene Association was held at St. Louis November 19th to 21st. It gave chief attention to the development of means for the exchange of ideas and experience among social workers and endeavored to forward the movement for social hygiene legislation in Missouri. The papers dealt with the progress of social hygiene and its relation to public health and vice repression; to the growth of public opinion with reference to the importance of venereal infection; to the medical aspects of social hygiene, in which special emphasis was given to the need of free and convenient facilities for diagnosis and treatment of infected persons; to education of people in all ages, in which it was emphasized that the home is the natural agency for such instruction; and to the repression of commercialized vice, particular attention being given to organized study and the perfection and enforcement of injunction and abatement laws. Abram W. Harris was chosen president for 1917. This association, together with its numerous State branches, has given especial attention to the cultivation of an informed public opinion regarding all phases of abnormal sex tendencies. Its publications in particular have devoted great attention to the education of youth in home and school. It was the medium through which the Metropolitan Life Insurance Company awarded a prize of \$1000 to Donald B. and Eunice B. Armstrong for the best statement of methods of instructing boys and girls from 12 to 16 in sex problems, published in *Social Hygiene*, July, 1916. In addition the American Association has

issued some 85 pamphlets dealing with nearly every question connected with the entire field of prostitution, venereal diseases, and sex education.

**VARIOUS CAMPAIGNS AND RESULTS.** The most successful of all of the State societies has been the Oregon Society, which has succeeded in arousing the united support of public opinion and newspapers in the suppression of quack advertisements and the conduct of a vigorous campaign of publicity. The Missouri Society, formed in November, had been preceded by numerous active local societies and began the prosecution of an active campaign for an injunction and abatement law and for the creation of public opinion. The Connecticut Society issued during the year a pamphlet entitled *For Parents* in English and the following foreign languages: Polish, Slavic, Hungarian, Italian, French, and Greek. The New York Society conducted a "Health Exhibit for Men" at Coney Island during the summer. In Delaware the State Society carried out an educational campaign in cooperation with women's clubs and school authorities. In Buffalo an active agitation was carried out by the Federation of Churches. At Kansas City the local Society for the Suppression of Commercialized Vice, formed in 1913, secured the creation of a "vice squad" in the police force; conducted numerous public meetings; and took advantage of the Billy Sunday campaign to enforce its ideas.

The Cleveland segregated district was closed early in 1915. The Lakeside Dispensaries situated near the old segregated district reported that eight months previous to this closing there were 112 listed cases of infection for venereal diseases, of which 42 per cent were contracted in the segregated district, whereas in eight months after closing there were only 18 listed and 35 unlisted cases. At Syracuse, where the segregated district was closed in 1913, there had been made three inquiries into the prevalence of venereal diseases. These showed that since 1910 up to the close of 1915 there had been a reduction of 27.7 per cent in the prevalence of gonorrhoea and of 45.4 per cent in syphilis. The reduction in the latter was attributed primarily to closing the segregated district, while the reduction of the former was due to better control of the liquor trade and disorderly hotels.

The report of the Baltimore Vice Commission published late in 1915 startled the country. On the basis of it the Society for the Suppression of Vice in Baltimore City prosecuted a most vigorous and effective agitation. It reported the following "Points Gained": all public houses closed; inmates offered an opportunity to enter an honest life; closing of assignation houses; lessened street walking; practical elimination of the white-slave traffic; reduction in social diseases; an improved morale of the police force. At Chicago the abolition of the segregated district necessitated the continuance of a fight against prostitution under numerous evasive forms. The Committee of Fifteen, however, kept up its investigations throughout the city in an effort to ferret out places being used for vice purposes. The enactment of an injunction and abatement law effective July, 1915, enabled it to force property owners to evict tenants without active prosecution in most cases. It was vigorously opposed by the Chicago Hotel Keepers' Protective Association. The committee

found, however, that convictions for pandering became more and more difficult with the increase of evasiveness of methods. It charged the police with "inefficiency and positive corruption." The Chicago Board of Education cooperated with the committee in investigating the character of houses near public schools. In Wisconsin the Psychiatric Institute at Mendota, a State research institution, authorized to make Wassermann and cerebrospinal fluid examinations free of charge, actively stimulated a great increase of such examinations throughout the State. Its record showed that out of 2500 cases of insanity in two State hospitals 13 per cent gave positive Wassermann reactions upon admission: of 600 cases of feeble-minded, 20 per cent; of 900 convicts in the State prison, 11 per cent. The Detroit Board of Health in its bulletin for March presented the results of extensive examinations of prostitutes and the following conclusions: most cases of venereal disease are due to illicit sexual intercourse; inmates of known houses of prostitution are only a partial factor in such contagion; repeated illicit intercourse will result in gonorrhoea or syphilitic infection in 94 per cent of cases.

**ABROAD.** War conditions raised tremendous problems of social hygiene in all belligerent nations. The military authorities of Germany, France, and Great Britain were especially active in carrying out every known device for prophylaxis and in the systematic examination and treatment of all known cases. Even in Holland, where the mobilization of considerable bodies of troops had been found necessary, the spread of prostitution and infection made regulation a primal necessity. In Germany clinics for diagnosis and advice were opened in Bremen and Berlin. In Great Britain the report of the Royal Commission on Venereal Diseases, published in 1915, contained an investigation covering the entire country. It recommended the establishment of free laboratory diagnosis and adequate skilled free treatment of all infected persons; and that the Local Government Board be authorized to meet 75 per cent of the expense from Imperial funds. It laid great stress upon the relation of alcohol to venereal infection. In New South Wales a committee modeled after the British Commission was authorized in July, 1915. Its first report showed the lack of statistics; the inadequacy of medical examination of prostitutes; the necessity of free public laboratory diagnosis for syphilis; the need for special instruction of nurses and the public; the desirability of protecting marriage by a special certificate; the necessity of requiring public reports of all cases of infection; and otherwise treated nearly every phase of the entire problem.

**ILLINOIS.** The Illinois Senate Vice Committee, created in April, 1913, and headed by Lieutenant-Governor O'Hara, issued a report of nearly 1000 pages in January. Among its conclusions were the following: poverty, directly and indirectly, is the principal cause of prostitution; thousands of girls enter prostitution because of inability to keep body and soul together on the low wages they receive; the low wages of fathers force many girls into industry, with consequent insufficient schooling, separation from home and adequate protection, thus becoming recruits for the system of prostitution; unregulated conditions of domestic labor result

in many servants entering commercialized vice; the system of segregation is a complete failure because it increases immorality and spreads degeneracy; many women desiring to supplement allowances of husband or parent are entering the so-called "call girl" system which has rapidly spread in recent years; the sale of intoxicants together with public dancing is a strong contributory cause; the highest standards of morals exist among girls in high schools and colleges; the proper treatment of women of the underworld would restore a large proportion to decency. See SOCIAL HYGIENE, BUREAU OF.

**Bibliography.** In addition to the publications above mentioned and numerous articles in public health reports, bulletins of the National Conference of Charities and Corrections, and numerous journals, the following publications were issued: Maurice A. Bigelow, *Sex Education*; Maude E. Miner, *Slavery of Prostitution*; W. Grant Hague, *The Eugenic Marriage* (4 vols.); The Oregon Social Hygiene Society, *Five Years' Work in Oregon*; Ernest R. Groves, *Moral Sanitation*; *Reports* by vice commissions in Bridgeport, Conn., and Paducah, Ky.; J. G. Fertig, *Commercialized Prostitution in St. Louis*.

**PROTEINS.** See ANAPHYLAXIS.

#### PROTESTANT EPISCOPAL CHURCH.

The total number of communicants in this denomination in the United States in 1916 was 1,066,970, an increase of 26,074 over 1915. The total number of communicants in the world was 1,086,089, an increase of 27,285 over 1915. In the Sunday schools in the United States were enrolled 53,389 teachers and 473,030 scholars. The total number in the world was 54,369 and 495,750 respectively. The total number of the clergy in the United States was 5598. The total number in the world was 5874. There were, in the United States in 1916, 433 candidates for orders and 444 in the world. The total contributions of the denomination for all purposes in 1916 amounted to \$20,124,013. There were, in 1916, 91 dioceses in the Protestant Episcopal Church in the United States, and 12 dioceses in foreign countries. The missions of the denomination are under the control of the Domestic and Foreign Missionary Society. The amount received for missionary purposes in 1916, including the emergency fund, was \$1,248,654.

During 1916 the Church lost by death three of its bishops: Bishop Brewer of Montana; Bishop Ferguson, missionary bishop of Liberia, west Africa; and Bishop Peterkin, of West Virginia. The bishops elected during 1916 were: Benjamin Brewster, bishop of Maine; Hugh Latimer Burleson, missionary bishop of South Dakota; Irving P. Johnson, bishop coadjutor of Colorado; James Wise, bishop coadjutor of Kansas; Frank Hale Touret, missionary bishop of Western Colorado; William F. Faber, coadjutor bishop of Montana, succeeding Bishop Brewer as bishop of Montana; Bishop W. L. Gravatt, coadjutor, succeeding Bishop Peterkin of West Virginia as bishop. The resignations of Bishop Osborne of Springfield, Ill., and Bishop Johnston of West Texas were accepted.

The General Convention of the Protestant Episcopal Church was held at St. Louis, Oct. 12-27, 1916. The attendance was large and well maintained, and the discussions marked by intellectual strength and catholicity of spirit. It was feared at first that the dispute over the Panama Conference, which brought out strong

differences between the High Church (or American Catholic) element and their opponents, might find its way into the Convention and produce strife; but this was happily averted. Opportunity was given for the expression of opposing views similar to those which had previously been expressed, but no crisis was precipitated, and such were the good temper and judgment displayed that the Panama question may be said to have faded from public view. The missionary work was vigorously emphasized. The Board of Missions made great progress during the year in vivifying the methods and spirit of a broad, national policy, and its efforts were approved with enthusiasm by the Convention. The work of Prayer Book revision was taken up with resolute deliberation, and a new Hymnal was adopted. The spirit of the Convention was that of consecration and efficiency, although in some respects the decisions were apparently conservative. Women were refused admission as delegates to the General Convention. The attempt to secure proportional representation of dioceses in the General Convention was defeated. Amendments to the canon on marriage and divorce, refusing re-marriage to all divorced persons, were lost. The Panama Canal Zone was created a missionary district. Endorsement was given to Armenian relief, to the Actors' Church Alliance, to temperance legislation and personal abstinence, to the censorship of moving pictures, and to the consolidation of the activities of the Board of Religious Education. Suffragan bishops were refused a vote in the House of Bishops. A board of 18 trustees for the pension fund was given full power to administer the same when effective. New commissions were appointed on home and family life, to promote peace and international friendship, and on parochial missions. A resolution was passed permitting Jewish communicants to observe racial and national festivals. A commission was appointed to visit Liberia, Central French Africa, and the Sudan; it was composed of Bishop Francis of Indianapolis, Rev. Harvey Officer, and Dr. James H. Dillard. Bishop Gailor was elected chairman of the House of Bishops. The next General Convention will be held at Detroit in 1919. See OLD-AGE PENSIONS.

**PROTOZOA.** See ZOOLOGY, *Protozoa*.

**PROVINCETOWN PLAYERS.** See DRAMA.

**PRUSSIA.** A European kingdom, the largest, most populous, and most powerful of the states of the German Empire. The capital is Berlin. The King is the German Emperor. See GERMANY, section *Area and Population*.

**PRZYBYSZEWski, STANISLAS.** See GERMAN LITERATURE, *Current Events*.

**PSICHARI, E.** See FRENCH LITERATURE, *Novels*.

**PSYCHICAL RESEARCH.** Mrs. H. Sidgwick (*Proc. S. P. R.*, 28) discusses the psychology of Mrs. Piper's trance-phenomena on the basis of all published records and of the unpublished accounts left by the late R. Hodgson. She thinks it probable that Mrs. Piper's trance is a state of self-induced hypnosis, in which the medium personates various characters. The hypnotic state brings with it an enhancement of the mental powers, in certain directions, above the normal level; in particular it enables the medium to receive telepathic communications. H. Bruce publishes a revised edition of his *Riddle*

of *Personality* (1908). In *Patience Worth* C. S. Yost reports automatic communications obtained by means of the ouija-board. The writing is done by a Mrs. Curran, a woman of education, but without special knowledge of English history or literature. She does not fall into a trance, and there is no hint of fraud or mystery in her performances. The communications, given in the name of "Patience Worth," a young English-woman of some three centuries ago, are characterized by words of Anglo-Saxon and Norman origin; they consist of conversations, epigrams, short poems, a long medieval drama, a long tale of a farm-lass "Telka," etc.; and the editor finds in them a high literary quality. Sir Oliver Lodge (*Raymond, or Life and Death*) prints a selection of letters which show the personality of his dead son, offers samples of evidence he has obtained for the survival of memory and affection after death, and enters at some length into the general logic of the hypothesis of continued personal existence. The most impressive evidential incident is the discovery of a group-photograph, taken in Flanders and wholly unknown to the family, whose details (including Raymond's place and attitude) were correctly described by two "sensitives."

The same writer (*Nineteenth Cent.*, 79) quotes Ovid's tale of Ceyx and Alcyone to prove the poet's familiarity with veridical death-wraiths and the acceptance, in the ancient world, of a mode of thought-transmission akin to what we now term telepathy. L. J. Martin (*Ps. Rev.*, 23) investigates a case of reputed prophecy of the California earthquake of 1906. The "prophecy" was based partly on scientific inference, partly on a process of constructive imagination whose motives are made clear; there was no premonition.

**PSYCHOLOGICAL ASSOCIATION, AMERICAN.** The 25th annual meeting was held at Columbia University, December 27th-30th, under the presidency of Prof. R. Dodge (Wesleyan). The 25th anniversary of the founding of the association was celebrated by a banquet on the evening of December 28th; Prof. M. W. Calkins (Wellesley), Pres. G. Stanley Hall (Clark), Prof. G. T. Ladd (Yale), and Pres. E. C. Sanford (Clark College) were the principal speakers.

**PSYCHOLOGY.** The influence of the war was still severely felt. Practically no books or periodicals were received from Germany; the Italian *Psiche* and two at least of the better known French periodicals seem to have suspended publication. In America, on the other hand, a new bi-monthly, *The Journal of Experimental Psychology*, appeared under the editorship of Professor Watson (Johns Hopkins).

Prof. O. Külpe (q.v.) of Munich, known by his contributions to psychology and theory of knowledge, the founder of the "Würzburg school" of experimental psychology, died at the age of 53. Prof. H. Münsterberg (q.v.) of Harvard, a distinguished psychologist and metaphysician, widely known in recent years by his studies in applied psychology, died suddenly at the same age. The science has also suffered by the death of E. Mach (q.v.), formerly professor of the history and theory of inductive science at Vienna; J. Royce (q.v.), professor of philosophy at Harvard; G. Ballet (q.v.), author of *Le langage intérieur*; N. Oppenheim, writer on the hygiene and development of the child;

A. Charpentier, authority upon psychological optics; and T. A. Ribot (q.v.).

**GENERAL BOOKS AND TREATISES.** W. B. Pillsbury's *Fundamentals of Psychology* is a textbook in general psychology written from the standpoint of an inclusive behaviorism. H. S. Langfeld and F. H. Allport published an *Elementary Laboratory Course in Psychology* which outlines 30 illustrative experiments.

The year showed a renewal of interest in motor theories of consciousness, and a decrease of interest in behavioristic theory. H. C. McComas (*Ps. Rev.*, 23) argues against the motor theories of Dewey, Münsterberg, and Judd on the logical ground that they ascribe inferentially to a whole class what we know to belong only to a part, and on the factual grounds that they overlook the extreme complexity of the human nervous system and assign to the motor areas an unwarranted importance for consciousness. C. Rahn (*Ps. Rev. Mon. Suppl.*, 21, 4) agrees with Stumpf and Titchener in rejecting the principle of dynamogenesis. Consciousness he believes to occur, not in connection with movement, but at the point of inhibition of overt behavior. M. F. Washburn, on the other hand, attempts in *Movement and Mental Imagery* not only to find middle ground between opposing motor theories but also to sketch a new hypothesis that shall answer for the higher processes at large. Consciousness depends upon a certain ratio between excitation and inhibition of the motor response to a stimulus. It may appear when the initiation of a motor response is too slight to arouse actual movement; at this level there is, however, no association, since association of ideas is conditioned upon association of movements. If the response involves, simultaneously, both consciousness and association, we have attention. If it is adequately initiated and entirely unopposed, so that there is no delay, we have habitual action without consciousness. "Tentative" movements, so slight as almost to escape introspection, furnish the unanalyzed residual contents of "imageless" processes. The "image" occurs when a sensory excitation is debarred from its usual motor outlet and passes through other sensory centres on its way to an unaccustomed path of motor discharge. All this is confessedly hypothesis; but the author is able by means of it to attack some of the most difficult problems of human and animal psychology, and thus to make a notable advance upon current motor theory. E. S. Abbot (*Ps. Rev.*, 23), urging the need of a functional psychology of the entire organism, recommends the adoption of a biological point of view in psychology and psychiatry. J. B. Watson (*J. Ph. Ps. Sci. Meth.*, 13) would substitute the concepts of behavior for those of mental disease, and (*Ps. Rev.*, 23) would replace the method of introspection in human psychology by that of the conditioned reflex. A. Myerson (*Coll. Contrib. State Board of Insanity*, etc., Boston, Mass.) gives a general account of this type of reflex and of the theories which Pawlow has based upon his study of it; and K. S. Lashley (*Ps. Rev.*, 23) discusses the human salivary reflex and its possible uses in psychological investigation.

**SENSATION.** General. C. Rahn (*Ps. Rev. Mon. Suppl.*, 21, 4), writing upon "Sensation and its Physiological Conditions," finds a growing tendency to include central nerve-processes among the direct conditions of sensation. J. N.

Curtis (*Am. J. Ps.*, 27) undertakes an experimental study of "Duration and the Temporal Judgment." Duration may be either static length or moving progression. A sensation, taken as it immediately comes under an existential determination, merely "goes on"; duration is here attributive. When, however, the determination is to compare or to estimate, the durative experience becomes a perceptual length, realized as a whole when the progressive movement is completed.

**SMELL AND TASTE.** The outstanding work of the year is that of H. Henning (*Zts. f. Ps.*, 73, 74). Experimental psychology has been content, in general, to accept Zwaardemaker's revision of the old Linnæan classification of odorous qualities, and the same investigator's results in the matter of olfactory mixtures and compensations. Henning, after trial of over 400 stimuli, proposes a new classification. There are six fundamental qualities: fruity (lemon), putrid (H<sub>2</sub>S), flowery (violet), resinous (frankincense), scorched (tar), and spicy (nutmeg); these examples are typical only). The whole body of olfactory qualities, fundamental and intermediate, may be arranged on the surface of a triangular prism. At the six angles stand the pure fundamental odors (not yet definitely determined); along the edges, diagonals, and other cross-lines of the surface lie the qualities which "resemble" two or more of the fundamental qualities. These intermediate qualities are all psychologically simple; their relation to the fundamentals is analogous to that of a tone to the limiting tones of the octave within which it is placed. The basis of classification is introspective, though Henning hints also at a chemical correlation; likeness of inter-molecular combination appears to parallel likeness of olfactory quality. In the matter of mixture, Henning denies outright the analogy of odor and color: the olfactory experiences which result from dual stimulation resemble rather the tonal fusions, and like these evince degrees of fusion, ranging from the "combinational odor" to less unitary forms. In general, any olfactory quality may fuse with any other; but the nature of the fusion depends upon the nearness or remoteness of its components in the olfactory series. The various fusions may be represented, geometrically, on lines connecting the components and drawn across the interior of the prism.

The treatment of taste is no less radical. Henning recognizes the four fundamental qualities of sweet, sour, bitter, and salt, but insists that they are connected by series of simple intermediate qualities, whose relation to the pure qualities is akin to that of the intermediate colors to the pure R, Y, G, B of the color-square. The whole system of taste qualities may be arranged on the boundary-lines of a tetrahedron, with the pure fundamentals at the four angles. The mixture of gustatory stimuli gives fusions which in every case are readily analyzable; they may be represented on lines drawn through the body of the taste-figure.

This reformed psychology of taste and smell will not and should not command immediate assent; Henning's observations, especially those of olfactory mixture, must be repeated and varied. There can, however, be no doubt that the new classifications mark a definite advance in sense-psychology. Order has been brought, if not into chaos, at any rate into a very poorly

ordered field; and whether the arrangement be final or whether it prove to need modification, it affords a positive point of departure and point of attack.

**VISION.** E. M. Alapach (*Am. J. Ps.*, 27) brings experimental evidence of the psychological simplicity of the intermediate hues of the color-square and of green. J. Ward (*Brit. J. Ps.*, 8) and E. B. Titchener (*J. Ph. Ps. Sci. Meth.*, 13) continue the discussion of the sensory character of black. C. A. Hegner (*Zts. f. Sinnesphys.*, 49) reports on congenital differences in the color-vision of the two eyes; anomalous vision or partial color-blindness in the one eye may consist with normal vision in the other. R. Strohal (*ib.*) describes experiments in support of Hering's theory of antagonistic visual processes, and J. von Kries (*ib.*) and K. L. Schäfer (*Arch. f. d. ges. Phys.*, 160) offer additional proof of von Kries's dual theory of vision.

P. F. Swindle (*Am. J. Ps.*, 27) describes a positive after-image of long duration, obtained with dark adaptation and intermittent stimulation. What seems to be the same phenomenon has been made the subject of systematic investigation by G. H. Miles (*Brit. J. Ps.*, 8), who distinguishes it from the after-image proper, and explains it on the basis of "changes in the intensity of light received on the total retina, and altered conductivity of that portion of the visual tract which was originally excited."

**AUDITION.** G. J. Rich, in a pioneer study of tonal volume, finds (*J. Exp. Ps.*, 1) an approximate constancy of the relative difference-limen, which differs from that of pitch both in magnitude and in course. J. Peterson (*Ps. R.*, 23) decides that binaural beats are neither true beats nor referable to bone-conduction: they are rather periodically perceived changes in the localization of tones. New proof of the objective nature of difference-tones is furnished by J. Wittmann (*Arch. f. d. ges. Ps.*, 34); the use of phonoscope and fluctuating flame enables him to secure a visual representation of these combinational tones, and to show that they take their origin either in the membrane of the capsule or in the flame itself. He finds, further, that if the relevant partials are eliminated by interference the difference-tones disappear.

**CUTANEOUS AND ORGANIC SENSATION.** It is still an unsettled question whether and how far our sensations of pain evince qualitative differentiation. E. Becher (who succeeds Külpe at Munich) has explored the surface of the body (skin and mucous membrane) by means of mechanical, thermal, and chemical stimuli, and concludes that superficial pain may be reduced, in general, to two qualities: a bright and not necessarily unpleasant pain, which derives from the skin proper, and a dull pain which is seated in the subcutaneous tissues. There are, however, three local areas—the external auditory meatus, the dentin of the teeth, and the *glans penis*—which appear to mediate bright pains of specific quality (*Arch. f. d. ges. Ps.*, 34).

Head's theory of protopathic and epicritic sensibility has been attacked from two quarters. H. Carr (*Ps. Rev.*, 23) criticises the theory on grounds both of logic and of observation; and E. G. Boring (*Quart. J. Exp. Phys.*, 10) has repeated Head's experiment under improved conditions, and reports his own observations of the return of cutaneous sensitivity after section of

a sensory nerve. Boring finds that the results which Head's technique threw into high relief lose their special importance in the light of a more refined method, and take their place in a total body of fact which shows no such line of cleavage as Head has described. He himself outlines a theory of multiple innervation of the sensory "spots"; the nerve-supply is so distributed that, under varying conditions, summation or inhibition of excitations may occur in varying degree. An hypothesis of this sort is adequate to the data of observation, and avoids the duplication of sensibilities which Head had been led to assume.

In *The Control of Hunger in Health and Disease* A. J. Carlson demonstrates that the gastric *mucosa* is insensitive to touch and pain; finds (in agreement with Boring: *YEAR BOOK*, 1915) that the thermal sensations of stomach and œsophagus are introspectively separable as regards localization and pattern; and establishes a correlation between hunger and contraction of the walls of the stomach. In psychological analysis, hunger is (as Boring had also discovered) simply a complex of pressure and pain. Carlson further maintains that hunger is experimentally distinguishable from appetite; appetite may, indeed, appear in the absence of hunger, and may be aroused by weak chemical stimuli which inhibit the hunger-contractions.

FEELING. W. S. Foster and K. Roese (*Am. J. Ps.*, 27) attack the tridimensional theory of feeling on its own ground. They put their observers under the conditions which Wundt describes as typical for the various primary feelings, and make the feelings which these conditions induce the standard of reference in detailed experimental work. The theory does not stand the test; strain, relaxation, excitement, depression prove all alike to be composed in good part of kinæsthetic sensations. E. Becher (*Zts. f. Ps.*, 74) classifies pleasantness and unpleasantness as form-qualities or founded contents.

ATTENTION. The complication-experiment continues to furnish problems. Dunlap declared, some years ago, that the temporal displacement depends rather upon eye-movement than upon accommodation of attention. C. S. Yoakum (*J. Exp. Ps.*, 1) confirms this result, in so far that fixation must be under exact control; he adds, however, that the positive after-image is a further factor of prime importance. This image, in its turn, is a function of the general attitude of the observer; and in fact the nature of judgment seems in all cases to be conditioned upon the observer's disposition toward the experimental situation. K. M. Dallenbach has applied his method for the measurement of attention to the field of cutaneous sensation (*Am. J. Ps.*, 27); the results bear out those obtained for sight and hearing. H. Woodrow (*J. Exp. Ps.*, 1), working by objective methods, finds (in agreement with introspective report) that visual outline is a determinant of attention; adds modality to the list of known determinants (touch is more compelling than sound, and sound than light); and offers evidence in support of the view that every individual has a special "power or faculty" of attention, which characterizes his mental constitution.

IMAGE. H. E. Burt (*Am. J. Ps.*, 27) studies the conditions of arousal of the primary visual memory-image. Favorable conditions are complexity of contour, size, time of exposure, in-

terest excited by the object, and motor reinforcement (tracing of the object); unfavorable are motor and mental distractions (adding of figures). The one common factor in all these cases appears to be attention: the greater complexity, the longer exposure, make for more vivid experience and therefore for more durable impression. H. Clark (*ib.*) classifies images under three headings as (1) those that are familiar and have a particular reference, (2) the unfamiliar, and (3) those that have a general reference. Eye-movements, to which the author devotes particular attention, condition changes in the clearness of the image, are more likely to occur in secondary than in primary attention; and, in so far as they are characteristic, are transferred to image from perception. H. S. Langfeld (*Ps. Rev.*, 23), discussing the function of the image, concludes that it serves as a cue to the touching-off of an organic response which, in turn, is the meaning of the situation.

PERCEPTION. O. Leeser (*Zts. f. Ps.*, 74) reports experiments on the comparison of lines and surfaces. The average variable error in the estimation of extents conforms approximately to Weber's law. The estimation of quadrilateral surfaces is not rendered more accurate if judgment is based on estimation of length of side or of diagonal. R. Peter (*Arch. f. d. ges. Ps.*, 34) investigates the relation of primary and secondary factors in the perception of depth. In monocular vision, with all secondary criteria save magnitude of visual angle eliminated, the object seen under the larger angle is judged to be nearer. G. E. Müller (*Zts. f. Sinnesphys.*, 49) seeks to explain the change of apparent direction of a vertical line (band of light in a dark room) with change of the position of the head. Perception proves to be conditioned upon three groups or systems of factors: the position of the head, the position of the eyes, and the carriage of the trunk. By reference to these three systems, together with associative factors, Müller is able to account for the typical differences in observed result. J. Peterson (*J. Ph. Ps. Sci. Meth.*, 13) refers certain experiences of loss of orientation to conflict of motor attitudes. O. Sterzinger (*Arch. f. d. ges. Ps.*, 35) compares the rhythmical and the affective impressions made by (successive) musical intervals. Every interval has its intrinsic rhythmical form; the higher tone (all other things equal) carries the accent. The rhythmical form depends upon the time elapsing between the tones; the neutral or indifferent time is about half a second; shorter times favor an iambic, longer times a trochaic or spondaic rhythm. The intervals fall into a series as regards definiteness of rhythm, the average order from best to worst being: fourth, sixth, fifth, third or seventh, second; the octave varies greatly in position with the different observers. The average order of affective impression (best to worst) is: fourth, third, sixth, fifth, and octave, second, seventh. The course of the two curves is strikingly similar.

F. C. Bartlett (*Brit. J. Ps.*, 8), who works with mutilated forms and blots of ink, infers from his results that the essential factor in an act of perception is the "effort after meaning." The sense-data offer themselves as familiar; and the subsequent effort to make this familiarity definite arouses the associative and apperceptive processes which are characteristic of the act of

perceiving. H. J. Watt (*ib.*), in a theoretical paper, develops the thesis that stereoscopy is a purely visual integrative process. In a third installment of his contributions to the psychology of form and movement, K. Koffka (*Zts. f. Ps.*, 73) presents a general criticism of the work, experimental and theoretical, of V. Benussi, who since the death of Witasek has become the standard-bearer of the Austrian school. Koffka believes that analysis into sensory components destroys the characteristic *quale* of perception; the immediate problem is to describe perception in terms of its own positive attributes.

**MEMORY AND RECOGNITION.** H. C. Warren (*Ps. Rev.*, 23) publishes the first part of an historical study of association, covering the systems from Plato to Hume. F. P. Boswell and W. S. Foster (*Am. J. Ps.*, 27) show that, in the case of learning a vocabulary, the intention permanently to retain increases the amount recalled. G. C. and C. E. Myers (*ib.*) sought to recall, under a persistent determination, stanzas of poetry, names of classmates, etc., that had long been "forgotten." All sorts of casual experiences served to revive the proper associations, and in the end a surprisingly large amount of material was reproduced. Diurnal variations in memory and association are noted by A. I. Gates (*Univ. of California Publ. in Ps.*, 1). M. H. and E. K. Strong (*ib.*) conclude from a study of reaction-times that recognition depends upon the rearousal of identical associations, and is to be understood as an awareness of the ease or difficulty of nervous (associational) discharge. L. V. Viqueira (*Zts. f. Ps.*, 73) finds that the recognition of a meaningless syllable is favored if it occupies its original position within some visual pattern.

On the side of theory, E. Jones (*Brit. J. Ps.*, 8) continues the discussion of the relation of depression to memory. R. Müller-Freienfels (*Arch. f. d. ges. Ps.*, 34) distinguishes three types of memory, which represent as many genetic stages: orienting memory, which expresses itself in attitudes (such as familiarity) and feelings (such as the vague feeling of change); reproductive memory; and productive memory, which freely combines the materials furnished by the lower type. E. Becher (*ib.*, 35), arguing that physiological hypotheses have broken down, outlines a "psychistic" theory of memory in terms of psychical residua (actuated by neural excitation) and mental association. S. I. Franz (*J. Exp. Ps.*, 1), taking as text the fluctuations shown by aphasics in the relearning of the names of objects, warns against the prevailing tendency to regard cerebral activity as exclusively mechanical.

**EMOTION.** In *Man: an Adaptive Mechanism* G. W. Crile (see YEAR BOOK, 1915) returns to the subject of the emotions, which he regards as modes of biological adaptation by means of the distance-receptors. Every emotion is a form of muscular activation, phylogenetically determined; appropriate stimulation of the distance-receptors "drives" certain organs (notably thyroid, liver, adrenals), with consequent exhaustion of the brain-cells. We are plainly on the disputed ground of the James-Lange theory, which J. R. Angell (*Ps. Rev.*, 23) regards as not materially affected by the work of Sherrington and Cannon.

**ABSTRACTION.** *Purpose.* S. C. Fisher (*Ps. Rev. Mon. Suppl.*, 21) has published a careful

and detailed study of *The Process of Generalizing Abstraction; and Its Product, the General Concept*. Four groups of meaningless forms were made the basis of the experiments, and the observers were required to frame a definition of every group-form. "The essence of the process of generalizing abstraction consists in a specific and characteristic mode of behavior in consciousness of a succession of imaginal or sensory contents, i.e. in their changing relative locality, and in their temporal aspects"; "this behavior of the contents of consciousness is immediately experienced as such." "The essence of the concept, as it occurred to consciousness under the conditions of our experiment, consisted in the fact that certain essential features, in varying structural form, entered consciousness in a specific manner when the situation demanded them. This 'specific manner' of entrance, or this 'behavior' in consciousness of the concretely or verbally imaged essential features, constituted fundamentally the experience of generality."

H. C. Warren's "Study of Purpose" (*J. Ph. Ps. Sci. Meth.*, 13) is concerned analytically with purposive consciousness and genetically with purposive activity. The discriminable factors in consciousness of purpose are forethought, assent, a feeling of potency, the self-notion, and the sense of fitness. Objectively, the whole sequence of events in growth and behavior appears capable of explanation in mechanistic terms.

**SOCIAL PSYCHOLOGY.** Wundt's *Elemente der Völkerpsychologie* has been translated by E. L. Schaub under the title *Elements of Folk Psychology*. H. K. Haberlin (*Ps. Rev.*, 23) subjects Wundt's doctrine to a trenchant criticism. Wundt defines the social mind as an over-individual synthesis, and as possessed of actuality, although in his psychological system actuality is immediacy of experience, and must therefore be individual. Furthermore, Wundt holds that the attributes of the social mind are to be determined by analysis of its products, while such analysis in Wundt's own hands shows that "the laws of folk-psychology which are supposed to characterize the attributes of the folk-soul, are . . . but applications of individual psychology." Haberlin believes that Wundt is led into these difficulties partly by the false analogy of the individual as synthesis of psychical elements and the group as synthesis of individuals, partly by a mistaken view of the relation between psychology and history. M. Bentley (*Ps. Rev. Mon. Suppl.*, 21) lays out a programme for constructive work in this branch of psychology. Social psychology rests upon mental "interaction," the nature of which must be empirically determined. The sources of enquiry are the human group, the individual regarded as member of a group, and the products of the group. The characteristics of two types of group, the congregate (individuals in physical proximity) and the assemblage (individuals subject to common social influences, but not physically conjoined), are worked out in some detail. Sample studies of the crowd and the audience are given by H. Clark and C. H. Woolbert (*ib.*).

G. O. Ferguson (*Arch. of Ps.*, no. 36) writes upon the psychology of the negro; and S. S. George (*Am. J. Ps.*, 27) corrects a current error with regard to the gesture of affirmation among the Arabs. E. B. Titchener (*Proc. Am. Ph. Soc.*, 55), relying on experiments of his



own, argues that the tests of color vision and tactile discrimination employed by Rivers and McDougall in Torres Straits were inadequate to their purpose. C. Read discusses the psychology of animism and the relation of animism and magic (*Brit. J. Ps.*, 8). A. J. Todd (*Am. J. Ps.*, 27) brings evidence to show that the primitive notion of the self is not individual but social. W. Trotter, in *Instincts of the Herd in Peace and War*, speculates upon the psychological aspects, the biological significance, and the sociological applications of the gregarious instinct, and explains certain racial differences, as displayed in the present war, in terms of aggressive, defensive, and socialized gregariousness. G. le Bon's *Psychology of the Great War* (translated by E. Andrews) is rather a discussion of the war by a psychologist than a positive contribution to social psychology.

**PSYCHOTHERAPY.** The year brought several translations of Freudian works: S. Freud, *Wit and Its Relation to the Unconscious* (A. A. Brill); *Leonardo da Vinci* (A. A. Brill); O. Rank and H. Sachs, *The Significance of Psychoanalysis for the Mental Sciences* (C. R. Payne); C. G. Jung, *Psychology of the Unconscious* (B. M. Hinkle). W. A. White's *Mechanisms of Character Formation* is an introduction to the theory and practice of psychoanalysis. The various psychoanalytical studies of genius have been brought together by L. Dooley (*Am. J. Ps.*, 27). The same author employed the method of word-association combined with introspection for the detection of Freudian complexes in the normal subject (*ib.*).

**MENTAL TESTS.** Present interest appears to centre in methodology rather than in result. Among the important books and articles of the year are: L. M. Terman, *The Measurement of Intelligence*; C. D. Mead, *The Relation of General Intelligence to Certain Mental and Physical Traits*; J. V. Haberman, "The Intelligence Examination and Evaluation" (*Ps. Rev.*, 23); T. H. Haines, "Relative Values of Point-scale and Year-scale Measurements of 1000 Minor Delinquents" (*J. Ev. Ps.*, 1); A. S. Otis, "Some Logical Aspects of the Binet Scale" (*Ps. Rev.*, 23). A. I. Gates's investigation of diurnal variations in efficiency (*Univ. of California Publ. in Ps.*, 2) shows the use of mental tests in the direct service of education.

E. Claparède's *Psychologie de l'enfant* has appeared in a fifth edition. New versions (E. S. Kite) have been published of two works by A. Binet and T. Simon, *The Development of Intelligence in Children* and *The Intelligence of the Feeble-Minded*.

**PSYCHOLOGY, EXPERIMENTAL.** See PSYCHOLOGY.

**PSYCHOLOGY, SOCIAL.** See PSYCHOLOGY, *Social Psychology*.

**PSYCHOTHERAPY.** See PSYCHOLOGY, section so entitled.

**PUBLIC BUILDINGS.** See ARCHITECTURE.

**PUBLIC DEBT.** See financial section of articles on various countries.

**PUBLIC SCHOOL ADMINISTRATION.** See EDUCATION IN THE UNITED STATES.

**PUGILISM.** See BOXING.

**PULMOTOR.** See RESUSCITATION.

**PURDUE UNIVERSITY.** A co-educational State institution at Lafayette, Ind., founded in 1869. In the fall of 1916 the total enrollment was 2178. There were 214 members in the fac-

ulty. Moses Fell Dunn of Bedford, Ind., left to the university a legacy of \$100,000. The productive funds of the institution amount to \$340,000 and for the year 1915-16 the total income was \$929,983. The library contains 55,000 volumes. President, Winthrop Ellsworth Stone.

**QUAKERS.** See FRIENDS, RELIGIOUS SOCIETY OF.

**QUALITATIVE ANALYSIS.** See CHEMISTRY, GENERAL.

**QUANTITATIVE ANALYSIS.** See CHEMISTRY, GENERAL.

**QUANTUM THEORY.** See PHYSICS.

**QUARANTINE OF PLANTS.** See HORTICULTURE.

**QUEBEC.** The largest province of the Dominion of Canada, extending from Ontario, the United States, and New Brunswick northward to Hudson Strait. The city of Quebec is the capital. Area, 706,834 square miles, of which 15,969 water. This area includes that portion of the Northwest Territories annexed to Quebec in 1912. Previously the area of the province was 351,873 square miles; between 1901 and 1911 the population of this area increased 21.49 per cent, or from 1,648,898 to 2,003,232. In 1911 Montreal, by far the largest city of Canada, had 470,480 inhabitants; Quebec, 78,710; Maisonneuve, 18,684; Hull, 18,222; Sherbrooke, 16,405; Westmount, 14,579; Three Rivers, 13,691; Verdun, 11,629; Lachine, 10,699; St. Hyacinthe, 9797; Sorel, 8420. Of the population 10 years of age and over in 1911, males numbered 737,401 (50.67 per cent) and females, 717,930 (49.33); of these, 552,140 males and 101,101 females were reported as employed in gainful occupations. Of the males employed, 36.5 per cent were in agriculture, 19.6 in manufacturing, 12.3 in building trades, and 11.2 in trade and merchandizing; of the females, 37.1 per cent were in domestic and personal service, 33.5 in manufacturing, 15.2 professional, and 9 in trade and merchandizing.

The provincial government is administered by a lieutenant-governor, appointed by the Governor-General of the Dominion; he acts through an executive council, or responsible ministry. The legislative power is exercised by two chambers, the Legislative Council and the Legislative Assembly. Members of the former, 24 in number, are appointed for life; members of the latter, numbering 81, are elected for five years. In the 12th Parliament, which convened in 1911, Quebec was represented by 24 Senators and 65 members of the House of Commons. The latter number remains constant, and the representation of the other provinces is proportionate, on the basis of population as ascertained at the regular decennial census. The Lieutenant-Governor in 1916 was P. E. Leblanc, appointed Feb. 10, 1915, in succession to Sir Francois Langelier.

**QUEBEC BRIDGE ACCIDENT.** See BRIDGES.

**QUEENSLAND.** The northeastern state of the Commonwealth of Australia, lying north of New South Wales and east of the Northern Territory and South Australia. The estimated area is 670,500 square miles, which is about 22.5 per cent of the area of the Commonwealth. The population according to the 1911 census was 605,813 (329,506 males, 276,307 females), exclusive of full-blooded aboriginals. The increase per cent in the decade 1901-11 was 21.62, in

1891-1901, 26.52, in 1881-91, 84.39. Estimated population, June 30, 1915, 689,678. The capital is Brisbane; its population at the 1911 census was 39,917; including suburbs, 139,480; estimate in 1914, 154,011.

The Chillagoe Railway, 103 miles long, was bought by the Government of Queensland for \$2,187,000. It has three branches, two of which belong to the State, which was forced to depend on the privately owned Chillagoe Railway to connect with the general government system. The third branch, the Mt. Mulligan line, was also owned by the Chillagoe Company.

The executive authority rests with a governor, who is appointed by the crown and is assisted by a responsible ministry. The Parliament consists of the Legislative Council and the Legislative Assembly. The Council consists of members nominated by the crown for life; their number is 36, but may be increased indefinitely. The Assembly consists of 72 members elected for three years by universal suffrage. The Governor in 1916 (from 1914) was Major Sir Hamilton John Goold-Adams, G.C.M.G.; Premier and Attorney-General, T. J. Ryan. See AUSTRALIA.

**QUICKSILVER (MERCURY).** The demand for quicksilver in 1915 was stimulated owing to the large consumption of the metal in the manufacture of war supplies, and the generally prevailing high prices resulted from the great demand. There were in 1915 39 producers of quicksilver in the United States. Of these 32 were in California, 4 in Nevada, and 1 each in Arizona, Oregon, and Texas. The total output in 1915 was 31,033 flasks of 75 pounds each, compared with 16,548 flasks in 1914. The production in California increased 26 per cent in quantity and 112 per cent in value in 1915. The exports of quicksilver in 1915 amounted to 33,725 flasks, valued at \$225,509. The imports amounted to 421,884 pounds, valued at \$282,752.

The domestic output of quicksilver in 1916, according to preliminary estimates made by the United States Geological Survey, amounted to 29,942 flasks, of 75 pounds each, valued at about \$3,643,800. This was the largest output since 1905. The States producing in order of rank are California, Texas, Nevada, Oregon, Washington, and Arizona, all of which increased their output except Nevada. The output for California in 1916 was 20,550 flasks valued at \$2,587,245, compared with 14,283 flasks, valued at \$1,174,881 in 1915. The combined output of Texas and Nevada was 7975 flasks, valued at \$1,004,052.

The price paid for quicksilver in 1916 was the highest in the history of the industry. The average domestic price for January was \$222 a flask. This increased to nearly \$400 a flask, but fell considerably, and the average price prevailing from July to December was about \$75 a flask.

**RABIES.** According to a bulletin of the Department of Health, city of New York, during the seven years preceding 1916 an average of more than 4500 persons have been bitten by dogs of that city as reported to the Department of Health. During the past year a report has been secured on each case, where practicable, of the circumstances under which the bites were received. Of over 3000 dog-bites reported since Sept. 1, 1914, at which time a special muzzling ordinance became effective, over one-tenth of the cases were attacked by dogs while leashed; an-

other 10 per cent of bites were inflicted by dogs supposed to be effectively muzzled. In over 200 cases the dogs were both leashed and muzzled. In other words, nearly 1000 persons were bitten in New York City under conditions in which attacks are supposed to be impossible, because of leashing, or muzzling, or both. These figures apparently show that many muzzles fail of their purpose, and do not prevent the infliction of bites by the animals so restrained.

There was an epidemic of hydrophobia in California, 33 cases being reported. Twelve of the victims were bitten in the face, one was bitten through the tongue, and the others on various parts of the body. The earliest deaths occurred 16 days after the bite was received, both patients having been bitten on the face.

In the neighborhood of Paris there was a notable increase in the number of cases of this disease during 1916, seventeen cases being reported between March and July. This situation is attributed to the evacuation of houses in the military zone and the consequent increase of the number of homeless dogs. Measures looking to the destruction of unmuzzled dogs, and those without an owner, and the quarantining of suspected animals have been taken by the prefect of police.

D. L. Harris, professor of hygiene at the St. Louis University School of Medicine, published the results of an investigation of the treatment of rabies with a desiccated virus, comparing its effectiveness with the Pasteur method. The latter method begins with the injection of 1 cm. of spinal cord dried for 14 days, followed, day by day, for 18 to 21 days, with cord extract of increasing infectivity, the two-day cord being the most infective which he felt could be used without infecting the patient. The effect of these injections is that in the course of three weeks immune bodies appear in the blood; and those patients survive in whom the incubation period of the infection is longer than the time required for the establishment of an active immunity. This required time is from 15 to 20 days after the completion of the treatment. The success of the treatment depends, therefore, on the fortunate circumstance that in man the incubation period of rabies is seldom less than three or four weeks and is usually about seven weeks. Pasteur regards as complete failures only those patients who develop hydrophobia later than 15 days after the completion of the treatment.

Pasteur's scheme requires the daily inoculation of one or more rabbits and the removal of the cords. It is therefore expensive and demands facilities which are to be found only in well-equipped laboratories. Modifications of the method have had for their object the establishment of an immunity which would appear earlier and be greater than that afforded by the Pasteur treatment. Such modifications have been tried by Hogyes, Ferran, Proescher, Calmette, Fermi, Marie, and Cummings. The modification which Harris describes is founded on Shackell's very original investigations on the effect of desiccation *in vacuo* at a low temperature. This method has for its object the preservation of fixed virus, in order that it may be prepared in quantity and be always available for treatment. By using both brain and cord, enough material is obtained for 30 complete treatments with the virus from a single rabbit;

and since the material can be stored until needed, there is no waste, and no unnecessary work is required of the laboratory staff during periods when patients are lacking or very few in number. Furthermore, with this product, treatment may be administered in less than half the number of days required by the original method.

The preparation of the material is as follows: Brain and cord, stripped of pia and blood vessels, are ground in a mortar into a homogeneous, thick, paste-like mass; carbon dioxide snow, collected from a tank into a sterile cloth, is added to the paste until freezing is complete and until further grinding reduces the mass to a fine powder. This powder is transferred quickly to a cold beaker and placed in a Schibler's jar which has been submerged in a mixture of salt and ice ( $-18^{\circ}\text{C}.$ ). In the upper part of the jar is a beaker of concentrated sulphuric acid. A vacuum of less than 2 mm. is produced and the powdered brain is kept at  $-18^{\circ}\text{C}.$  in the salt and ice until desiccation is complete. A single brain and cord will be completely dehydrated in from 36 to 48 hours. If the brain and cord have been thoroughly ground, completely frozen, and absolutely dried at a temperature not above  $-18^{\circ}\text{C}.$ , the resulting powder will be almost as infective as the fresh untreated brain and cord. When kept *in vacuo* at  $0^{\circ}\text{C}.$  there is no appreciable loss in infectivity for several months. When kept in an ice box ( $8^{\circ}$  to  $10^{\circ}\text{C}.$ ) for 500 days this powder is five times as infective as an equal quantity by weight of Pasteur's cord that has dried five days. The value of this method is shown by the record of 1159 cases treated with but two deaths, in both of which the disease developed before the possibility of antibody formation.

Harris points out that the average time required for the complete administration of the treatment is less than one-half that demanded by the Pasteur method. The 936 patients treated by Couret and by himself averaged less than 10 days per patient, a saving of more than 9000 days of treatment over what would have been required had the Pasteur scheme been followed. This is a matter of great importance to those who are obliged to travel from home to the city for treatment. As a concrete instance, the State board of health of Indiana has a fund for caring for indigent patients while they are receiving antirabic treatment. In one year the amount spent by the State for board was \$900 less than it would have been had these patients received the usual Pasteur treatment.

The latest report of the Pasteur Institute (Paris) records 654 persons treated during the year 1915, with a single death. Among nearly 6000 persons treated in the past 10 years at the parent Pasteur Institute there have been only 11 fatalities. See also VETERINARY MEDICINE.

**RABINOWITZ, SOLOMON.** See ALEICHEM, SCHOLEM.

**RACING.** Thoroughbred racing had a banner year in 1916. Larger stakes were offered than in previous seasons and larger crowds patronized the sport. The greatest attendance of the year was that at the running of the Suburban Handicap at Belmont Park on Memorial Day when 40,000 persons gathered at the track.

August Belmont headed the list of winning owners with a total of \$69,450, the earnings of *Hourless* and *Friar Rock* contributing chiefly to

this amount. R. T. Wilson's horses brought him \$66,738, *Campfire*, the biggest winner of the year, accounting for \$48,868.

Other owners who reaped large harvests were: James Butler, \$59,565; H. P. Whitney, \$36,815; Emil Herz, \$35,355; H. G. Bedwell, \$24,825; J. O. Talbott, \$20,954; H. C. Hallenbeck, \$20,980; Marrone Stable, \$18,565; L. Wood, \$17,368; Andrew Miller, \$15,990; Brighton Stable, \$15,320.

*Campfire* and *Friar Rock* stand out as the best horses of the year, the former winning six races out of nine starts and the latter earning the distinction of being the first three-year-old to win both the Brooklyn Handicap and the Suburban Handicap.

The winners of the more important stakes in 1916 were: Metropolitan Handicap, H. C. Hallenbeck's *The Finn*; Futurity, R. T. Wilson's *Campfire*; Brooklyn Handicap, August Belmont's *Friar Rock*; Carter Handicap, E. B. Cassatt's *Trial by Jury*; Suburban Handicap, August Belmont's *Friar Rock*; Saratoga Handicap, August Belmont's *Stromboli*.

The leading jockeys of the year were F. Robinson and Johnny McTaggart, who together captured 297 first places.

Racing in Europe again suffered severely as a result of the war. In England the principal event was the running of the New Derby Stakes at Newmarket which were won by E. Hulton's *Fifinella*. The winning English owner was H. Ellis with a total of \$14,675. Richard Croker's horses took down \$12,125 in purses.

Trotting and pacing in the United States proved popular, more than 1000 races being held throughout the country. Thomas W. Murphy led the list of winning drivers with \$81,910. Walter R. Cox was a close second, his total being \$73,330. *Mabel Trask* carried off the palm among the trotters, her earnings amounting to \$33,320. Of the pacers, the best showing was made by *Miss Harris M.* with \$9527. Three trotting records were established. *Lee Azworthy* (stallion) covered a mile at Syracuse, N. Y., in 2 minutes, and at Lexington, Ky., in 1:59½; and the *Real Lady* (two-year-old) went a mile at Lexington, Ky., in 2:04¼.

#### RACQUETS AND COURT TENNIS.

Clarence C. Pell won permanent possession of the Gold Racquet trophy by defeating Joshua Crane in the final round of the tournament held at Tuxedo Park, N. Y., 15-8, 15-1, 15-3. The national amateur racquets singles title, however, went to S. G. Mortimer, who defeated Pell in the final round of the tourney held at Boston, by a score of 15-12, 15-2, 15-12. The doubles title was won by Lawrence Waterbury and J. C. Waterbury, who triumphed over G. H. Brooke and J. C. Wear at 15-10, 8-15, 15-4, 15-5, 15-11.

Jay Gould once more successfully defended his title in court tennis by coming out victorious over Joshua Crane in the final round of the tournament held at New York City. The score was 6-2, 6-3. In the court tennis doubles Jay Gould and W. H. T. Huhn captured the championship by defeating Charles E. Sands and Payne Whitney. The score was 6-4, 6-1, 6-1.

Walter Kinsella retained his professional laurels as a result of his victory over Cecil Fairs of London, England, the score being 6-4, 6-4, 6-0.

The amateur squash championship was won by S. W. Pearson, who defeated C. R. Drewry

15-9, 15-3, 15-10. The national title went to Jack Soutar after a hard battle with William Ganley. The score was 14-17, 14-15, 18-15, 15-12, 15-10. Walter Kinsella was the winner of the professional championship. He defeated S. J. Feron in the series held in New York City by a score of 15-7, 15-6, 15-7, 15-9, 15-3, 15-4.

**RADCLIFFE COLLEGE.** A non-sectarian institution for the education of women at Cambridge, Mass. It is affiliated with Harvard University and was founded in 1879. In the fall of 1916 there were 126 graduate students, 481 regular students, and 65 special students. The faculty numbered 140. The largest bequest received by the college during the year was \$32,000 from the estate of Helen Collamore. Later \$20,000 will be available from a trust fund created by Miss Collamore. Construction was begun of a wall to surround the college grounds and of gates, the first part of the work being provided for by gifts of relatives and friends of Mrs. Agassiz and Miss Irwin. The college is residuary legatee (to the amount of about \$250,000) of Abigail W. Howe, who died in 1916. The productive funds of the college amount to \$1,045,000, from which it drew an income in 1916 of \$62,000. The library contains 38,000 volumes. President, Le Baron Russell Briggs.

**RADIATION.** See PHYSICS.

**RADIOACTIVITY.** See PHYSICS.

**RADIO-TELEGRAPHY.** See WIRELESS TELEGRAPHY AND TELEPHONY.

**RADIUM.** Studies in the activity of this element show that there are three types of radiations given off by radium: (1) The Alpha rays, which are chemically most active, but have slight power of penetration, are almost completely absorbed by the containers in which radium salts are commonly held, and therefore do not affect external objects. (2) The Beta rays, which are chemically less active and less absorbable. (3) The Gamma rays, which are similar to the hard Roentgen rays, being probably even more penetrating than the latter. The beta rays can be separated from the gamma rays in a magnetic field, since the former are thereby deflected.

In general, slight exposure to radium emanations stimulates vital processes, whereas intense exposure inhibits or retards them. The retardation may be cumulative and persistent through several generations of cells. Many investigators have been studying the biological effects of radium rays on living matter, but arriving at diverse conclusions. Schwarz believes that radium decomposes the lecithin in the cells. Hertwig and his pupils conclude that directly and chiefly radium affects the chromatin of the cells. Packard suggests that the lytic enzymes in the cells, rather than the synthesizing enzymes, are stimulated, and that by activating autolytic enzymes which effect degeneration of the complex proteins radium acts indirectly on the chromatin and the protoplasm. Recently Packard has set forth the results of a study of the effects of beta and gamma rays on protozoa and on the egg cells of sea urchins and other low forms of life. He observed that not only do cells differ from each other in their susceptibility, but that each cell seems to vary in this respect during different phases of its own activity. Some protozoa are entirely un-

affected by long and vigorous radiation, while others are killed by comparatively short exposure. In some cells the chromatin is chiefly affected, in others the protoplasm. Packard believes that those cells which are injured contain substances which absorb the rays, while those which are unaffected allow the rays to pass through unchanged. The factor which still remains to be discovered is the material which determines the power of absorption. It thus appears, from a medical point of view, that until more is known about the influences which determine absorption and penetration of the various radiations, it will be impossible to predict the effect of a given exposure to radiation, and treatment, therefore, must remain more or less empirical.

**RAILWAY ACCIDENTS.** While the conditions of railway operation in the United States were far more active in 1916 than in previous years, yet a reasonably good record for safety was maintained and a spirit of increased caution was prevalent. Many of the more flagrant conditions leading to accidents had been improved or at least appreciated, and there was a keen realization of the various defects of equipment and operation for which some solution must be sought. Thus in several instances, explained and unexplained, the human element figured, and the chances for man failure leading to serious accidents were realized as often more than a possibility that threatened. It was urged that relief should be sought with practical automatic train stops or other devices which for long lines had not been developed to the point where they could be generally adopted. Defects in rails and roadbed also were realized as likely to escape careful inspection and to develop possible failures that might be disastrous in their consequences, especially where heavy loads were the common rule and high speeds were maintained. With what results these efforts have been attended may be appreciated from the accompanying statistics of the Interstate Commerce Commission.

A serious source of fatalities and injuries continued to be the large number of trespassers who invaded the right of way and employed it as a walk. It has been difficult for the railways to secure the cooperation of local authorities in dealing with this nuisance which annually is responsible for the deaths of many children, not to mention adults.

While there were perhaps the usual number of collisions and derailments in 1916, there were not so many accidents that stood out in their frightful mortality as in other years.

The series of unfortunate accidents on the New York, New Haven, and Hartford continued and was marked by a rear-end collision of west-bound passenger trains two miles east of Milford, Conn., on the morning of February 22nd, about 11.21 o'clock. Six passengers and four trainmen were killed and some 276 employees and passengers were injured. A local passenger train No. 5 had left New Haven, about seven miles east of the point of collision, ran into express passenger No. 79, which had preceded it by two minutes and had been stopped by a defective air brake hose. The flagman, running back to signal No. 5, was run over by its engine, presumably while he was stooping to fasten a torpedo to the rail, while both engineer and fireman of the local were killed.

The engine of No. 5 and the rear car of No. 79, a new steel coach, were thrown to the left and into a freight train moving in the same direction on the adjacent track, and the wreckage of both passenger trains and of a part of the freight was scattered across the four main tracks. The boiler of the locomotive of No. 5 exploded and was thrown over the freight train to a point 50 feet out in a field. Eastbound passenger train No. 10, running at high speed, came on almost at the same moment that the collision occurred and was stopped but a short distance away from the obstruction on its track.

The most serious accident of the year occurred on the New York Central Lines West, near Amherst, Ohio, at about 3.18 A. M., on March 29th, in which two eastbound passenger trains met in a rear-end collision, and a westbound passenger train on the adjacent track ran into the wreckage. Twenty-seven persons were killed and 47 were injured. The two eastbound trains were the first and second sections of No. 86, the Chicago-Pittsburgh-Baltimore Limited, which left Toledo, 81 miles from the scene of the accident, at 1.43 A. M., and 1.56 A. M., respectively. Train No. 25, the Twentieth Century Limited, westbound, left Cleveland, 32 miles east of Amherst at 2.34 A. M. All of these trains were a little behind time, and were being run somewhat faster than the scheduled rate, but well within the speed limit of 70 miles per hour. There was a heavy fog at Amherst at the time of the accident, extending 15 or 20 miles west, but this did not interfere, however, with the operation of the first section of No. 86, whose engineer received a caution indication at the distant signal west of the Amherst interlocking plant. He came to a stop about 200 feet west of the home signal and then, starting to proceed, his train was struck at the rear by train second No. 86, whose engineer was certain he had received a signal for a clear track. The two rear cars of the first section, a coach and a club car were derailed and thrown across the westbound track, where they were run into in less than a minute later by the Twentieth Century Limited. The casualties chiefly were among the passengers riding in the coach and two men, a Pullman porter and a New York Central employee off duty, in the club car.

As this accident was in a way typical of what might readily occur at any time on a high-grade American railway, interest attaches to the following paragraphs from the report of the Interstate Commerce Commission on this accident, as a commentary on current practice:

"During foggy or stormy weather, when signal indications can be seen but a short distance, positive and definite instructions should be given prohibiting the running of trains at high speed. Accidents such as this may be expected to occur unless those in charge of the operation of this property at once take steps to see to it, by such check, observations, and other means as may be found necessary, that speed is materially reduced in foggy weather."

The extent of the hazard is then indicated as follows:

"This accident again directs attention to the fact that competent and experienced enginemen are not infallible, and that even a modern and complete block-signal system does not afford absolute protection against disastrous collisions.

... When trains are operated at high speed while the weather is so thick and foggy that signals can be seen a distance of only a few feet, no system of roadside signals can provide that measure of protection to which the traveling public is entitled. The number of serious collisions which have occurred within the past five years, due to enginemen failing to observe and obey roadside signal indications, demonstrates how imperative is the need of some device that will supplement the human element and assume control of the train in case the engineman fails properly to control his train."

Another serious rear-end collision of passenger trains occurred on the New York, New Haven, and Hartford. This was at Bradford, R. I., about 7.30 P. M., April 17th, and one passenger car, occupied by about 35 passengers, was crushed and immediately afterward took fire. Four passengers and one employee riding as a passenger were killed and about 30 passengers were injured. Two or more of the passengers lost their lives in the flames, which spread so rapidly that rescue was impossible.

Bradford, where this accident occurred, is on the main line, between Providence and New London, 23 miles east of New London. Local passenger train No. 633, behind time, was entering the side track at Bradford when it was run into at the rear by a following express passenger train, No. 25, which, notwithstanding the application of the emergency brake, struck the waiting train at a speed, said to have been, at the moment of collision, about 15 miles an hour. As train No. 633 consisted of three wooden cars, when the rear car was crushed, fire at once started in the wreck, and was rapidly spread by gas from a ruptured gas tank. The flames were soon beyond control, and all of the cars of train 633, together with the station buildings, were destroyed.

In 1916 the Pennsylvania Railroad system, which carried in its trains more people than in any previous year of its history, maintained its good record of not losing the life of a single passenger in a train accident of any kind.

During 1916 there were transported safely, on the lines east and west of Pittsburgh, 196,294,146 passengers, and at the same time the heaviest freight traffic ever handled by the Pennsylvania Railroad system was moved over its lines. The entire Pennsylvania Railroad system, taking into account every affiliated company either east or west of Pittsburgh, at the end of 1916 had to its credit three full calendar years in which no passenger had been killed as a result of a train accident on any portion of the lines. During this period 553,890,063 passengers—equal to 5½ times the population of the United States—were safely transported a total distance of approximately 15,000,000,000 miles. Upward of 9,000,000 trains, carrying both passengers and freight, were operated by day and night, over 12,000 miles of railroad line and 27,000 miles of track, while these passengers were being taken on their journeys without loss of life. On the lines of the Pennsylvania Railroad, east of Pittsburgh, no passenger's life was lost in a train accident during any of the preceding four calendar years, and in that period 616,626,957 people traveled safely over these lines alone.

**BLOCK SIGNALS.** While the block signal system, as may be seen from our annual rec-

ord, is not of itself able to prevent accidents, yet it does increase safety and accordingly it is of interest to learn that the mileage of railroads in the United States operated under the block system, on Dec. 31, 1916, was 99,885 miles, an increase of 2076 miles over the total reported at the end of 1915. In *automatic* mileage, which is the more significant figure in any consideration of increased safety at the end of 1915, the total was 32,978 miles for 1916, or 1818 miles above 1915. In manual signaling, the increases were largely offset by discontinuances, and corrections of errors and also by sections where the manual was superseded by the automatic.

The detailed comparison of the totals as compiled by the *Railway Age Gazette* for five years was as follows:

MILES OF ROAD IN THE UNITED STATES WORKED BY THE BLOCK SYSTEM

	—Automatic—		—Manual—		—Total—	
	In-crease over Jan. 1 prev. year	Jan. 1	In-crease over Jan. 1 prev. year	Jan. 1	In-crease over Jan. 1 prev. year	Jan. 1
1917	32,978	1,818	66,907	258	99,885	2,076
1916	31,160	1,471	66,649	8,206	97,809	9,677
1915	29,689	3,566	58,448	Decrease	88,132	943
1914	26,128	8,827	61,062	5,127	87,185	8,954
1913	22,296	1,961	55,935	Decrease	78,231	1,821

The Panama Railroad was operated throughout by the block system, nearly all automatic.

In Canada the block system was operated on 8526 miles of road, of which 617 miles were automatic, as shown in the following table:

LINES IN CANADA WORKED BY THE BLOCK SYSTEM

	Miles of Road		
	Automatic	Manual	Total
Canadian Government (Inter-colonial)	43	....	43
Canadian Government (Trans-continental)	..	6*	6
Canadian Pacific (Eastern)	222	4,535†	4,757
Canadian Pacific (Western)	36	18	54
Grand Trunk	5	3,850	3,855
Grand Trunk Pacific	4	....	4
Michigan Central	245	....	245
Toronto, Hamilton & Buffalo	62	....	62
	617	7,909	8,526

\* Electric train staff.

† Includes 113 miles electric train staff.

**GRADE CROSSING ACCIDENTS.** In 1916 serious accidents at grade crossings continued and there were many examples of gross carelessness on the part of motorists as well as inadequately protected crossings. These the railways were endeavoring to eliminate and coöperation with State or local authorities was being arranged to that end. But attempts were being made to improve conditions at once and the special committee on the prevention of accidents at grade crossing, of the American Railway Association, J. A. McCrea (Long Island), chairman, presented at the autumn meeting a report recounting its conferences with the committee of the National Association of Railroad Commissioners, and with representatives of the American Automobile Association. A committee of railroad lawyers was appointed to draft laws to be presented to different legislatures, and presented

three tentative drafts of bills. The first was substantially like that of the law in force in New Hampshire. It required cities and towns to maintain a cautionary signal at highway crossings, 300 feet or more from the tracks, with a penalty of \$1 a day for neglect. The committee recommended that the colors of such a sign should be white face with black letters, which was thought better, considering all hours of the day and night, than the white letters and blue background in use in New Hampshire. The second draft was similar to the first but included a section requiring the person controlling the movements of any self-propelled vehicle on passing the caution sign, to reduce speed to 10 miles an hour, with a penalty of \$10 for violation. The third draft went farther and required such vehicles to be brought to a full stop before crossing the tracks.

Several railroads had already carried out the recommendations previously published by the committees, and the railroad commission of California had made the caution approach sign, as recommended, the standard for the State of California. The committee urged all railroads to adopt at once the use of disks in place of flags at crossings, the painting of gates black and white, and the use of red lights at night.

These matters were further discussed by a committee of the National Association of Railroad Commissioners which reported, at the annual meeting of that body, the recommendations of a joint committee which included also the committee on the prevention of accidents at grade crossings. This report contained the following:

(1) That every grade crossing should be protected by an approach warning sign to be placed in the highway at a distance not less than 300 feet on each side of the railroad tracks, the sign to be a circular disk not less than 24 inches in diameter, painted white with a black border and black cross lines with the letters "R. R." in the upper quarters of the circle. Where it is deemed necessary this approach warning sign should be properly lighted at night.

(2) That the railroad companies maintain within the limits of their rights of way proper cautionary signs such as are now in use or authorized by law, and where deemed necessary this approach warning sign should be properly lighted at night.

(3) That all lights displayed at night towards the highway at grade crossings shall be red.

(4) That all crossing flagmen use during the day a uniform disk 16 inches in diameter, painted white with a black border, and the word, "Stop" painted thereon in black letters about five inches high, instead of the vari-colored flags, which are now in use.

(5) The uniform painting of all crossing gates with alternate diagonal stripes of black and white.

(6) That the railroad companies wherever practicable be required to maintain their property at grade crossings free of obstruction to vision, also that the highway approaches to crossings shall be so graded that the free passage of vehicles shall not be impeded.

(7) That the National Association of Railway Commissioners, the American Railway Association, and the American Automobile Association consider the advisability of agreeing upon what-

ever legislation may be necessary in the several States to make thoroughly effective the precaution of grade crossings; and that it is advisable that a uniform law requiring vehicles approaching such a crossing to reduce speed to a safe limit at the warning approach sign.

**GREAT BRITAIN.** In 1916 the railways of Great Britain, after the bad record of 1915, returned to their more normal and safe operation. Only four passengers were killed in train accidents during the year, a record distinctly comparable with that of 1901 and 1908, when none were killed, and in 1909 when one was killed. In this connection British railways pointed to this record with justifiable pride, as notwithstanding a curtailment of passenger and other trains, there was considerable extra traffic on the railways, and heavier duties and the longer hours, as a rule, were placed upon a much reduced staff, from which many of the best men had joined the colors.

One passenger, riding in a horse-car attached to an otherwise empty passenger train, was killed in a collision at Bletchley on August 11th, and one was killed in a collision at Warminster on September 2nd. A slight collision occurred at Lincoln on October 2nd, and a passenger, who did not complain at the time, died subsequently. The fourth fatality was suffered by a postal clerk who was killed in a serious collision at Wigan on December 19th. As regards the number killed in any accident the worst record of 1916 was at Kiltimagh on December 19th, when five ballastmen, riding in a car, were killed in a collision.

**ITALY.** In Italy in connection with the heavy and unusual traffic due to the war there was at first evidence of demoralization and from the end of 1915 through the first half of 1916, railway accidents were more frequent and serious than those in France and England combined. Exclusive of minor accidents involving merely damage to freight trains, but no unusual loss of life, there were three serious accidents during the nine-week period beginning December 27th and ending March 4th, resulting in fatalities to 52 persons and 169 being more or less injured. These and other accidents were explained on the general basis of lack of preparedness to adapt the various lines to military conditions and operations. For a long time Italian lines were quite unable to handle the immense freight and passenger traffic necessarily developed by the war.

In a serious accident that occurred at the end of the year 1915 near Bologna, a passenger train carrying both civilians and soldiers ran full speed into the rear of a freight train, with the result that the freight was derailed and 17 persons killed and 60 injured. This accident was due to fog, no signal lights on the freight train, and no warning to the engineer of the passenger train that a freight train was ahead. Then between Padua and the way station of Vigodarzere there occurred an accident in which two passenger trains collided, killing six passengers and injuring some dozen others.

The most serious of all the accidents took place February 26th, at 1.30 A. M., near the town of Cortona, to the south of Florence. A military troop train going at full speed was thrown down a 15-foot embankment, killing 19 soldiers and injuring 79 others. The loss of life and the great number of injured were largely due to the

use of wooden cars, several of which were at once broken and splintered.

On the night of March 4th, 13 miles from Ancona, on the Adriatic Sea, a military train, which had just left Caetellammare, collided with a fast train from Ancona, and 10 passengers were killed and 30 injured. It is but fair to state, however, that later in the year conditions improved and the Italian railway service was beginning to handle its troop trains as well as work its entire service with safety and dispatch.

**RAILWAYS.** On July 20, 1916, President Wilson signed a bill providing for a joint congressional committee to make a general investigation of railway transportation in the United States. The possible scope of the investigation was so broad as to include almost every conceivable aspect of the economics of railway operation and regulation, including government ownership. In May the Canadian government undertook the investigation of the whole Canadian railway situation, including the question of government ownership. The results of these two investigations may have a most important bearing on the future development of railway transportation in North America.

The Railway Executives' Advisory Committee, of which Frank Trumbull was chairman, was largely instrumental in getting the United States Congressional investigation started, and in the hearings which were begun November 23rd, before the joint committee of Congress, counsel for this committee set forth the legislative programme of railway executives. As briefly summarized by Mr. Trumbull in an address at Evansville, Ind., on December 15th, the programme advocated by the railways was as follows:

1. Exclusive Federal regulation, in behalf of all the States, so that regulation may be unified and symmetrical, and, therefore, more efficient.

2. Regional commissions, in order that regulation may be kept close to the people. This is further desirable because rate-making is largely done regionally, and commerce is not restricted to State lines.

3. Exclusive Federal supervision of future issuance of securities of railway companies. The railroads do not object to this supervision, but do object to its being done as at present by 19 or 20 different States, no two of which are alike in their methods.

4. In order that security issues may be intelligently supervised, Federal incorporation of interstate carriers would logically deserve consideration.

5. Division of functions of the Interstate Commerce Commission so that the same men will not be acting as prosecutors, judges, and jury.

6. Amelioration of the injustice to investors under which increases in rates can be suspended for 10 months instead of for, say, 60 days. This limitation on profits by the Federal and State governments differentiates railroad securities from other industries and necessarily puts a limitation on wage adjustments, which other industries do not feel.

7. Power in the Interstate Commerce Commission to prescribe minimum as well as maximum rates.

William J. Bryan and others appeared before the Congressional committee offering testimony

opposing an extension of Federal regulation to the curtailment of State regulation. Sovereign State rights and the paramount needs of local interests in railway service and rates, were the principal reasons given by Mr. Bryan. The hearings were being continued into 1917.

As administered up to and including 1916, railway regulation in America was not satisfactory to the railway managers, the general public, or to investors in railway securities. In 1916 the earnings of the railways were the largest in their history, nevertheless railway credit during the whole year was low compared to industrial credit. Railway facilities at the end of 1916 were obviously inadequate, but there was little new mileage of railways being built, and new equipment was being bought only because the need for it is so pressing as to be imperative.

The early part of 1915 was a period of very meagre railway earnings, only alleviated by drastic economies both in upkeep of the properties and in cost of handling the business offered. There was hardly any sign of the impending change until October, 1915. Then traffic came with a rush, and every single month from that time to the end of the year had been for that particular month in the year a record breaker in point of gross earnings. Until during the period under review, average gross earnings per mile for the railways as a whole in a single month of \$1150 were good, and there apparently was only one month, October, 1912, when average earnings per mile had exceeded \$1300.

Complete earnings figures for the calendar year 1916 as the YEAR BOOK went to press were available for only the nine months from January to September, inclusive. The largest earnings in the year are usually made in October and November, and this, when the complete figures are available, probably will be shown to have been true of 1916, but average total earnings per mile per month for the nine months, January to September, inclusive, were, for 1916, \$1279; and in three of these months, May, June, and July, more than \$1300 was earned, while in August and September all previous records were broken, with total earnings averaging \$1418 and \$1409 per mile.

**RAILWAY EARNINGS.** Nineteen hundred and sixteen was a record-breaker in the matter of railway earnings. Whether considered from the point of view of the fiscal year ended June 30th, or of the calendar year, both the gross and the net revenues of the steam railways of the United States were the largest in their history. For the fiscal year 1916 the gross revenues of steam roads having annual operating revenues above \$1,000,000 amounted to \$3,396,808,234. This was greater by half a billion dollars, or \$508,000,000, than their revenues during the lean year of 1915. Compared with 1913, the last record or peak, the revenues of 1916 showed an increase of more than a quarter billion dollars, or \$261,000,000. Similarly, the net revenues of the million-dollar railways in 1916 were the greatest in history, amounting to \$1,176,804,001. This was an increase of nearly a third of a billion, or \$319,000,000 over 1915, and an increase of \$233,000,000 over the previous record year of 1913. The million-dollar roads operate over 90 per cent of the total railway mileage, and earn over 95 per cent of the

total railway revenues; their returns are therefore fully representative of railway operations as a whole.

**OPERATING EXPENSES** in 1916 were also on the increase. They amounted to \$2,220,004,233, which represented the greatest annual expenditures in the history of American railways, although only slightly greater than their expenses in 1914, which was the next largest year in the matter of expenses. The increase over 1915 was \$189,000,000. That the railways were able in 1916 to keep their expenditures down to within \$1,000,000 of those for 1914, although they were doing considerably more business, speaks well for the economy and efficiency with which the railway managers were handling their properties in 1916. In fact, when reduced to a per mile basis, the operating expenses in 1916 were actually less than in 1914. A large part of the economy, however, was exercised in the maintenance of way account. Maintenance of way expenses in 1916 were cut by \$14,000,000, traffic and transportation expenses by \$9,000,000, and general expenses by \$4,000,000. There was an increase of \$26,000,000 in maintenance of equipment.

While the business done by the railways in 1916, as measured in ton-miles and passenger-miles, was greater than ever before, the increase was most marked in the matter of freight. Ton-miles increased about 25 per cent over 1915, and passenger-miles about 6 per cent; freight traffic was appreciably greater in 1916 than in 1913, while passenger traffic was about the same as in the heavy years of 1913 and 1914.

**FREIGHT CONGESTION.** On the lines terminating at New York and on the New England lines, the congestion of freight traffic became serious. Through selfishness or panic, many manufacturers ordered more fuel and raw materials than they had storage room for and held the railway cars for long periods. Lack of ships at New York was an important factor in the congestion, but New England lines were more congested even than the Eastern trunk lines. At one time there were 57,000 freight cars on the New York, New Haven, and Hartford Railway and its subsidiary, the Central New England. This was at least 12,000 cars more than could be handled satisfactorily. Embargoes were placed against freight entering New England, but these embargoes were not in time to prevent severe congestion.

There was shortage of freight cars at first in the West and in the later months of the year over the entire country. The restricted purchases of cars and locomotives in 1914 and 1915 was also a factor in the situation. There was also a large amount of delayed maintenance work to be done both in repairs to equipment and renewal of rails, ties, bridges, etc. This meant that the railways had to come into the market for new equipment, steel, and other materials and for labor at a time when the prices of materials and labor were mounting rapidly.

**RAILWAY EQUIPMENT.** In the 12 months of 1916 the railways, private car lines, and other users of cars and locomotives in the United States and Canada placed orders for 2891 locomotives, 165,324 freight cars, and 2540 passenger cars. (Figures compiled by the *Railway Age Gazette*.) In the same period orders were received from foreign countries by builders in



the United States and Canada for 2983 locomotives and 34,214 freight cars, making totals respectively of 4974 locomotives and 199,538 cars. In view of the exceptionally high prices at which all this equipment was sold this means that 1916 was undoubtedly the busiest year in the history of the car and locomotive business. Consider domestic orders alone: about 2900 locomotives at \$30,000 each which, if anything, is rather low, \$87,000,000; about 165,000 freight cars at \$1500 each, \$247,500,000, and 2500 passenger cars at \$18,000 each, \$45,000,000, making a very conservative figure of \$379,500,000. It is not so easy to estimate the total for foreign orders, but the value was at least \$170,500,000, making a total for both foreign and domestic car and locomotive business of \$550,000,000, or well over \$10,000,000 a week. The prices of freight and passenger cars actually advanced from 75 to 80 per cent over what they were a year previously; they were almost three times what they were two years before at the end of the year.

**NEW RAILWAY MILEAGE.** During 1916, 1,098.41 miles of new lines were built in the United States. New second track amounted to 312.31 miles, with additional third, fourth, and other main tracks to the extent of 31.06 miles. While the total mileage of new lines was considerably more than that of 1915, it was still less than for any other year since 1864. In Canada the mileage of new lines built was 290.04 with 7.09 miles of additional second track. This compares with 718 for 1915 and a maximum of 3013 which was reached in 1913.

An addition of 50 miles of completed line was reported for the government railway of the United States in Alaska (q.v.), which, with the total of 34 miles reported last year, gives a total completed length of this road of 84 miles.

**RAILWAY EQUIPMENT ORDERS IN 1916**  
(*Railway Age Gazette*)

	<i>Locomotives</i>	<i>Freight Cars</i>	<i>Passenger Cars</i>
Domestic .....	2,891	165,324	2,540
Foreign .....	2,983	34,214	109
<b>Total</b> .....	<b>4,974</b>	<b>199,538</b>	<b>2,649</b>

**CLASSIFICATION OF LOCOMOTIVES ORDERED**  
1911-1916  
(*Railway Age Gazette*)

	1916	1915	1914	1913	1912	1911
Mikado .....	754	562	338	796	1,309	590
Switching .....	780	221	201	688	821	448
Consolidation ..	63	194	166	828	858	577
Mallet .....	218	120	59	72	168	112
Pacific .....	278	102	174	566	594	486
Santa Fe .....	325	75	68	...	...	...
Ten-wheel .....	40	39	48	255	864	238
Mogul .....	28	12	24	42	61	127
Mountain or Mohawk .....	182	9	12	24	...	2
Atlantic .....	2	1	34	46	5	9
American .....	1	1	19	8	8	27
Electric .....	32	69	59	94	75	133
Other .....	238	168	73	103	252	406
<b>Total</b> .....	<b>2,891</b>	<b>1,573</b>	<b>1,265</b>	<b>3,467</b>	<b>4,515</b>	<b>2,850</b>

**AMERICAN RAILWAY ACCIDENT STATISTICS**

Summary of casualties to persons for the years ended June 30, 1916 and 1915

<i>Item</i>	<i>Steam railways</i>				<i>Electric railways</i>			
	1916		1915		1916		1915	
	<i>Killed</i>	<i>Injured</i>	<i>Killed</i>	<i>Injured</i>	<i>Killed</i>	<i>Injured</i>	<i>Killed</i>	<i>Injured</i>
<b>Passengers:</b>								
In train accidents .....	141	3,850	89	4,648	4	708	9	769
Other causes .....	142	4,529	133	7,462	21	1,208	26	1,696
<b>Total</b> .....	<b>283</b>	<b>8,379</b>	<b>222</b>	<b>12,110</b>	<b>25</b>	<b>1,916</b>	<b>35</b>	<b>2,465</b>
<b>Employees on duty:</b>								
In train accidents .....	804	3,852	221	3,871	10	97	9	111
In coupling accidents .....	123	2,194	90	1,993	4	22	...	14
Overhead obstructions, etc. ....	59	1,310	45	1,083	1	20	...	21
Falling from cars, etc. ....	384	12,196	368	10,748	4	106	7	134
Other causes .....	1,101	23,374	370	20,865	18	214	8	221
<b>Total</b> .....	<b>1,971</b>	<b>42,426</b>	<b>1,594</b>	<b>38,060</b>	<b>37</b>	<b>459</b>	<b>24</b>	<b>501</b>
<b>Total passengers and employees on duty</b> .....	<b>2,254</b>	<b>50,805</b>	<b>1,816</b>	<b>50,170</b>	<b>62</b>	<b>2,375</b>	<b>59</b>	<b>2,966</b>
<b>Employees not on duty:</b>								
In train accidents .....	9	60	5	72	...	...	...	4
In coupling accidents .....	...	...	...	10	...	...	...	...
Overhead obstructions, etc. ....	5	13	...	...	...	...	...	...
Falling from cars, etc. ....	57	292	45	237	1	1	...	16
Other causes .....	230	361	165	470	...	2	8	5
<b>Total</b> .....	<b>301</b>	<b>726</b>	<b>215</b>	<b>840</b>	<b>1</b>	<b>8</b>	<b>8</b>	<b>25</b>
<b>Other persons not trespassing:</b>								
In train accidents .....	11	92	7	110	...	7	1	25
Other causes .....	1,467	4,352	1,156	5,280	216	923	190	1,093
<b>Total</b> .....	<b>1,478</b>	<b>4,444</b>	<b>1,163</b>	<b>5,390</b>	<b>216</b>	<b>930</b>	<b>191</b>	<b>1,118</b>
<b>Trespassers:</b>								
In train accidents .....	84	119	88	161	1	...	...	...
Other causes .....	4,763	4,990	4,996	6,287	130	103	103	106
<b>Total</b> .....	<b>4,847</b>	<b>5,109</b>	<b>5,084</b>	<b>6,448</b>	<b>131</b>	<b>103</b>	<b>103</b>	<b>106</b>

Item	Steam railways				Electric railways			
	1916		1915		1916		1915	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Total accidents involving train operation	8,880	61,084	8,278	62,848	410	3,411	356	4,215
Non-train accidents *	486	119,296	343	99,192	36	1,160	16	932
Grand total	9,366	180,380	8,621	162,040	446	4,571	372	5,147

\* This item includes certain classes of casualties that for the year 1915 were included in the items "Other causes," under the various classes of persons as shown in the table.

Figures for the year 1915 cover only industrial accidents to employees not involving train operation. The corresponding figures for the year 1916 are, for steam railways, 398 employees killed, 116,699 injured, for electric railways, 15 employees killed, 974 injured.

DERAILMENTS—STEAM RAILWAYS

Causes	Year ended June 30, 1916				Year ended June 30, 1915			
	Number	Persons		Damage to road and equipment, including clearing of wrecks	Number	Persons		Damage to road and equipment, including clearing of wrecks
		Killed	Injured			Killed	Injured	
<b>Due to Defects of Equipment</b>								
Defective wheels:								
Broken or burst wheel	404	6	29	\$490,500	355	8	53	\$394,569
Broken flange	399	8	44	433,000	346	2	49	311,556
Loose wheel	106	2	15	87,800	100	1	11	69,122
Miscellaneous wheel defects	90	2	17	68,500	86	..	29	49,467
Broken or defective axle or journal	490	3	50	452,500	367	6	104	362,766
Broken or defective brake rigging	472	4	68	346,900	390	3	54	261,704
Broken or defective draft gear	319	2	33	173,700	280	3	41	173,106
Broken or defective side bearings	182	..	29	109,300	141	..	37	108,093
Broken arch bar	319	12	15	373,500	222	6	77	269,817
Rigid trucks	164	..	21	134,700	177	4	65	92,057
Failure of power brake apparatus	442	2	39	227,800	353	9	45	175,563
Failure of couplers	215	1	19	109,300	219	3	32	102,750
Miscellaneous	471	5	97	413,200	400	9	169	277,563
Total	4,073	47	476	\$3,420,200	3416	54	766	\$2,648,133
<b>Due to Defects of Roadway</b>								
Broken rail	272	7	261	\$328,500	272	6	527	\$342,342
Spread rail	105	2	111	61,000	90	3	147	55,339
Soft track	849	7	184	187,000	354	3	292	191,456
Bad ties	80	..	13	41,500	61	3	39	27,384
Sun kink	80	1	25	83,200	32	2	96	29,374
Irregular track	534	6	150	361,500	415	11	231	290,032
Broken or defective switch or frog	233	1	124	125,100	202	9	126	127,798
Miscellaneous	70	4	53	57,000	81	6	82	56,858
Total	1,673	28	921	\$1,194,800	1507	43	1540	\$1,120,583

SUMMARY OF ACCIDENTS RESULTING FROM COLLISIONS AND DERAILMENTS FOR THE 10 YEARS ENDED JUNE 30, 1916 \*

Year	Number	Persons—		Damage to road and equipment and cost of clearing wrecks
		Killed	Injured	
1907	15,458	1,291	16,236	\$12,865,702
1908	13,034	728	12,834	10,183,660
1909	9,670	606	9,560	7,480,208
1910	11,779	773	12,579	9,828,958
1911	11,865	785	11,793	9,851,780
1912	13,698	772	15,096	11,527,458
1913	15,526	791	14,565	13,049,214
1914	13,806	605	11,437	10,965,181
1915	10,387	382	7,554	7,800,898
1916	12,674	510	6,914	10,019,100

\* For years prior to 1911 the figures for persons killed and injured are restricted to passengers and to employees on duty. Returns for electric railroads are included in the same years.

As might be expected, the largest mileage of new lines built in 1916 was in the Western and Southern States, for it was in these sections that there was the greatest need for additional railways. There were still considerable areas in these parts of the country without adequate mileage, and their development would be possible only as business conditions justify the roads in committing themselves to such work. The fact that no new mileage was reported as

having been built in 1916 in 14 States is not necessarily an indication that they now have adequate transportation facilities, but is in many cases a reflection of the recent uncertainty which had attended railway investment.

The cessation of railway construction work was particularly marked during 1916 and the years immediately before in those Middle Western States which had been most active in the passage of two-cent fare laws and other legis-

lation tending to restrict railway earnings or to increase their costs of operation. It was significant that no new lines had been built in Iowa, Missouri, Nebraska, and South Dakota in 1916, while in Oklahoma and Texas only 23 and 11 miles respectively had been built.

ered, making a total of 95,000 miles out of the 260,000 miles of railway in the United States. The director of the department of valuation estimates that at the same rate of progress the field work on all lines would be completed by Jan. 1, 1920. This field work formed the basis

## NEW RAILWAY TRACK BUILT IN 1916

UNITED STATES—	No. Cos. building	Miles				Total
		First track	Second track	Third track	Fourth or more track	
Alabama	4	33.50	2.50			36.00
Alaska	1	50.00				50.00
Arizona	1	8.50				8.50
Arkansas	7	13.21	1.86			14.57
California	5	78.77				78.77
Colorado	1	1.80				1.80
Connecticut			.55	8.72	5.02	14.29
Florida	5	44.05				44.05
Georgia	3	52.50	26.06			78.56
Idaho	2	19.59				19.59
Illinois	3	10.11	36.15	.25	.14	46.65
Indiana			14.38			14.38
Kansas	3	96.31				96.31
Kentucky	1	24.00	2.26			26.26
Louisiana	2	29.81				29.81
Maryland	1	8.50	5.62			9.12
Massachusetts	1	1.00				1.00
Michigan	3	37.00	19.31			56.31
Minnesota	2	10.20	14.90			25.10
Mississippi	4	36.90	19.00			55.90
Missouri			3.00			3.00
Montana	3	99.36				99.36
New Jersey	3	2.56	.89		2.02	5.47
New Mexico	1	1.46				1.46
New York	3	5.68	.68	6.17	4.32	16.80
North Carolina	3	23.00	6.50			29.50
North Dakota	2	36.94				36.94
Ohio	2	7.10	25.75	2.06	1.76	36.67
Oklahoma	3	22.80	6.19			28.99
Oregon	4	65.80	1.75			67.55
Pennsylvania	10	48.16	6.20	.14	.46	49.96
South Carolina	2	91.76	12.20			108.96
South Dakota			10.30			10.30
Tennessee	4	19.47	4.02			23.49
Texas	3	10.86				10.86
Utah			2.90			2.90
Virginia	3	14.58	82.69			97.27
Washington	5	55.65				55.65
West Virginia	4	28.27				28.27
Wisconsin	3	11.26	7.15			18.41
Wyoming	1	8.00				8.00
<b>Totals</b>	<b>108</b>	<b>1098.41</b>	<b>312.81</b>	<b>17.84</b>	<b>18.72</b>	<b>1441.78</b>
Canada	11	290.04	7.90			297.94
Panama	1	40.00				40.00

The mileage of second and other multiple main tracks completed was considerably less than that of 1915. At first glance this seemed to be inconsistent with existing conditions, for the railways were handling the heaviest business in their history, and in many instances were suffering from a lack of facilities. It should be remembered, however, that the increase in business was so recent that the managements had not had time since it had come to build additional main tracks. Among the projects which had been held up for some time, but which were being carried to completion, were the construction of the last gaps in the second tracks of the Erie and the Baltimore and Ohio, between Chicago and the Atlantic seaboard.

**VALUATION OF EXISTING RAILWAYS.** The Interstate Commerce Commission department of valuation continued during the year its vast work of making a physical valuation of the railways of the United States. This work was begun in 1914 and on Jan. 1, 1916, about 45,000 miles of line had been covered by the roadway and track parties. By the end of December about 50,000 miles additional had been cov-

ered, making a total of 95,000 miles out of the 260,000 miles of railway in the United States. The director of the department of valuation estimates that at the same rate of progress the field work on all lines would be completed by Jan. 1, 1920. This field work formed the basis of the so-called tentative valuations. Apparently under the law the valuation should be based on (1) the estimated cost of reproduction new—that is the cost at the time of building a new railroad exactly like the one in existence; (2) the cost of reproduction new less depreciation; and (3) a record of the amount that it actually cost to build the railway. In the tentative valuations only the first two bases were used because of the difficulty of obtaining the data for the third basis. Late in 1916 the first of the tentative valuations were served on the Atlanta, Birmingham, and Atlantic, the Texas Midland, the New Orleans, Texas, and Mexico, and the Kansas City Southern, while others were understood to be practically completed on the properties of the Elgin, Joliet, and Eastern, the Los Angeles and Salt Lake, and one or two other lines. The appearance of these reports gave the railways their first opportunity to ascertain the attitude which the government would take on many of the important questions. When the work was first undertaken they organized in order to extend the fullest coöperation to the Federal employees with the expectation that the aim of the government

would be to ascertain the fair value of the property. With the appearance of these reports there was marked disappointment on the part of the railway men, for they felt that the department of valuation was endeavoring to establish the lowest possible valuations and to force the roads to fight before the Interstate Commerce Commission or in the courts to establish the real value of their properties.

**RAILROAD RECEIVERSHIPS.** Two important roads were taken out of the hands of receivers in 1916 and two important roads went into receivership. Singular as it may appear at first glance, neither the character of the reorganizations under which the St. Louis and San Francisco and the Western Pacific were taken out of the hands of receivers, nor the causes which led to the receiverships of the Boston and Maine and the Texas and Pacific reflected conditions of railroad earnings or of railroad credit in the calendar year 1916. More significant really was the comparatively large number of small roads sold under foreclosure. The number of these sales showed that the security holders and creditors of these roads were willing to accept conditions as they found them without hope of material improvement in the near future. The plan under which the St. Louis and San Francisco was reorganized was dated Nov. 1, 1915, and the fact that it was not actually put into effect and the road taken over by the new company until the latter part of 1916 was because of technical opposition on the part of the Missouri railroad commission. The plan, therefore, was the expression of opinion of the bankers and large holders of securities as to what future conditions would be based on their outlook of 1915 and not on the outlook of 1916. The St. Louis and San Francisco, by the successful application of sound principles of railroading, had already laid the basis for a sound reorganization of its finances before the wave of industrial activity and large railroad earnings came. The Western Pacific's reorganization plan was dated Dec. 15, 1915, and represented a drastic sacrifice on the part of security holders recognizing that it would take considerable time to build up substantial net earnings and that in the meantime fixed charges must be very low. The fixed charges are at the rate of \$1000 per mile for the new company. The receivership of the Boston and Maine was due to the inability to harmonize conflicting interests of security holders of the parent company and leased line companies, and conflicting State regulation in regard to a general plan for a sound reorganization of the property without receivership. The Texas and Pacific receivership was also due to the failure of conflicting interests identified with the financing of the property to get together. It was thought that the success of the reorganization plans which had not gone as far as foreclosure sales would reflect more truly the state of railroad credit in 1916 than did the receiverships and foreclosures taking place in that year. The total mileage of roads put in the hands of receivers during 1916 was 4439 and at the end of the year there were 34,559 miles of railway in receivers' hands. The total mileage of railways sold under foreclosure in 1916 was 8355.

**INCREASED DIVIDENDS.** It has been the practice in the management of many railroads in the United States to cut dividends in hard

times and to restore them, or increase them, or pay an extra dividend in years of exceptional prosperity. The alternative to this would be to set up a specific "dividend fund" to which especially large appropriations could be made in prosperous years and on which the management could draw in hard times. The second method may be preferable, but the first is the one which has appealed to American financiers and investors. The speculative element in it is an attraction. It is to be expected, therefore, that so long as present methods prevail in a year of greatly increased gross and net earnings the dividend changes that will occur will be changes to a higher rate or extra dividends. If dividends are to be reduced in bad years, and at the same time railroad credit is to be maintained, and any future financing is to be done by the sale of stock, roads which are ably and conservatively managed, like the Louisville and Nashville, the Buffalo, Rochester, and Pittsburgh, the Norfolk and Western, the Chicago, Milwaukee, and St. Paul, and the Union Pacific must be expected to distribute to the owners some share of the increase in profits in an unusually prosperous year.

All of these roads did raise dividends, but as a matter of fact, only in the case of the Union Pacific and Norfolk and Western was there an extra distribution made representing extraordinarily large net earnings. The Louisville and Nashville, St. Paul, etc., simply resumed in 1916 rates of dividend which they had to cut in the hard times of 1914 and 1915. In almost every case of dividend changes on the larger roads the increases for 1916 were sound and conservative. The only one that compared in the slightest degree with the extraordinary profits being reaped by industrial and manufacturing companies was the Pittsburgh and Lake Erie's extra dividend of 20 per cent.

The more important dividend changes in the *rate declared* in 1916 as compared with 1915, were as follows: Atlantic Coast Line 5 to 7; Buffalo, Rochester, and Pittsburgh, 4 to 6; Chesapeake and Ohio, nothing to 4; Chicago and Milwaukee, 5 to 4; Cleveland, Cincinnati, Chicago, and St. Louis, nothing to 5; Illinois Central, 5 to 6; Louisville and Nashville, 5 to 7; Nashville, Chattanooga, and St. Louis, 5 to 7; Norfolk and Western, 6 to 7, and an extra dividend of 1 per cent; Pittsburgh and Lake Erie, an extra dividend of 20 per cent; Union Pacific, an extra dividend of 2 per cent.

**ADAMSON LAW.** On Saturday, September 2nd, both Houses of Congress passed a bill, which had been drawn up by Roger Adamson, which provided for an 8-hour basis of pay for railroad trainmen engaged in interstate commerce. On Sunday the President signed the bill, and signed it again on Monday so as to make sure of the signature being legal. This bill, which became a law with the President's signature, provided "that beginning Jan. 1, 1917, 8 hours shall, in contracts for labor and service, be deemed a day's work and the measure or standard of a day's work for the purpose of reckoning the compensation for services of all employees who are now or may hereafter be employed by any common carrier, by a railroad, except railroads independently owned and operated not exceeding 100 miles in length, electric street railroads and electric interurban railroads . . ."

Railway engineers, firemen, conductors, and

trainmen had been paid on a day basis. A day's work consisted either of 100 miles' run or 10 hours' work. Thus, the trainmen of a passenger train which ran 100 miles in two hours and a half were paid for a full day's work and were paid overtime for any additional distance they might run. On the other hand, the crew of a local freight train, which made only 85 miles in 10 hours were paid for a day's work on the basis of the 10 hours worked.

The Adamson law was passed by Congress at the request or insistence of President Wilson to avert a strike of the four great brotherhoods of railroad trainmen—the Brotherhood of Locomotive Engineers, the Order of Railway Conductors, the Brotherhood of Locomotive Firemen and Enginemen, and the Brotherhood of Railroad Trainmen. The strike was called for September 4th because the railroad managers had refused to change the contracts with the train employees so as to read 8 hours instead of 10 hours. The brotherhoods had refused absolutely to let this question go to arbitration. When the Adamson law was passed the brotherhood chiefs called off the strike, believing that the law gave them what they had demanded from the railroad managers, namely, that they should be paid for a day's work either when they had run 100 miles or had worked 8 hours, and should be paid overtime for any mileage over 100 miles or any time over 8 hours.

As a matter of fact, a law which would have provided specifically that 8 instead of 10 hours should be substituted in all existing contracts specifying hours as a basis of pay would, it was thought by many lawyers and legislators, have been unconstitutional. The law that was passed was so general in its terms that neither railroad employees nor railroad managers were able to agree on its meaning. The railroad managers insisted that the law provided for an 8-hour basic day and that therefore the mileage basis must be abandoned. This would mean that all men in passenger service would have to work from two to four times as long as they do now to earn a day's pay, and it would increase the number of hours which trainmen in fast freight service would have to work to earn a day's pay. It would increase the wages—not shorten the hours—of men in slow freight service, because they would begin to get paid overtime at the expiration of 8 hours instead of 10 hours; but with divisional terminals 100 miles apart or thereabouts as they are now, the length of run would have to be the same and therefore the number of hours worked, 10, 11, or whatever it might be, would be the same. The trainmen, of course, insisted that the mileage basis should be retained and the contracts simply changed by the substitution of 8 for 10 in specifying the number of hours.

The law was not expected to be put into effect on January 1st pending a test of its constitutionality in the United States Supreme Court. See ARBITRATION AND CONCILIATION, INDUSTRIAL.

**POMERENE BILL.** On August 29th the so-called Pomerene bill was signed by the President and became a law. This law embodied a carefully prepared codification of all the existing Federal laws on the subject of bills of lading and puts in statute form numerous common law principles; but most important of all it made the railroad company responsible for the acts of agents in signing bills of lading. Heretofore if the agent

signed a bill of lading for goods which were never delivered to the railroad the railroad company was not responsible for this unauthorized act of its agent. The discussion of this subject between bankers and railroad men had gone on for years. The movement of the cotton crop of the United States is largely financed on the basis of bills of lading issued by the railroad company for the bales of cotton received from the planters. Money is advanced by the local banks to the planter on the security of the bill of lading for the cotton which the planter has delivered to the railroad. The local banks send these bills of lading to the New York banks, and where the cotton is for shipment abroad, the bills of lading may be used as the basis of loans between foreign bankers and New York bankers. Heretofore if through fraud or for any other reason the bill of lading had been issued against cotton which had not been delivered to the railroad, the railroad could not be held responsible, the theory being that the company was not responsible for an unauthorized act of its agent, the agent being authorized to sign a bill of lading only upon receipt of the goods covered thereby.

There was one other piece of legislation which should be mentioned. The law which had provided that the actual value of baggage must be declared at the time of checking, and making the railroad company responsible for the full value, if it were lost or damaged, and also making the traveler liable to fine or imprisonment if he declared a false value, was repealed and railroad companies are now liable only to the amount of \$100 or \$200, as the case may be, as provided for in the baggage check.

**THE CANADIAN SITUATION.** The peculiar railway situation in Canada at the end of 1916 was comprehensively summed up in the *Railway Age Gazette* (New York):

"The Canadian House of Commons passed on the same day a bill which provides for lending the Canadian Northern \$15,000,000 to tide it over for a year and a bill appropriating \$150,000 for the expenses of a commission to make a thorough investigation of the whole railroad situation. Canada is face to face with a crisis in her relations with the Canadian Northern and the Grand Trunk Pacific. There are three alternatives which are being seriously discussed: The government can continue to lend money to these railroads until such time as they can begin to earn their fixed charges; or the government can refuse to continue lending money, with the result that default will occur and receivership for both the Canadian Northern and Grand Trunk Pacific apparently inevitably take place; or, lastly, the government can take over the two roads and add the 3550 miles of the Grand Trunk Pacific (including the National Transcontinental) and the 4966 miles of the Canadian Northern to the 1889 miles of railroad now operated by the Canadian government.

"All of the stock of the Grand Trunk Pacific is held by the Grand Trunk. Part—about 75 per cent—of the cost of building the Western division of the Grand Trunk Pacific was raised by the issue of bonds bearing the guarantee of the Dominion government and the remainder by bonds guaranteed by the Grand Trunk, and by bonds guaranteed by one or other of the provinces. The government itself built the Eastern division of the Grand Trunk Pacific (National

Transcontinental) and the portion of this which is now being operated, is being operated by the Intercolonial. The Canadian Northern stock is owned 40 per cent by the Canadian government and 60 per cent by Mackenzie, Mann & Co. The Canadian government guarantees \$45,000,000 of the company's debenture bonds and has made both cash and land grant subsidies to it. Some of the provinces have guaranteed certain issues of bonds.

"The securities of both the Grand Trunk Pacific and the Canadian Northern are very largely held in England. The Grand Trunk would probably be glad rather than sorry to give gratis its stock of the Grand Trunk Pacific to the government if it were thereby relieved of its guarantee of Grand Trunk Pacific bonds. For the government to get hold of the 60 per cent of the Canadian Northern stock held by Mackenzie, Mann & Co., however, would be a very different undertaking. It is hardly conceivable that Sir William Mackenzie would relinquish control of this stock without a bitter fight, and he has the reputation of being a very good fighter.

"Most thoughtful and patriotic Canadians agree that default on either Grand Trunk Pacific or Canadian Northern bonds, with resulting receivership, would be a blow to Canada's credit which should not be even considered. In the debates which took place in the House of Commons there were members who urged that if one-seventh of the railroad mileage of the United States was in the hands of receivers it would be no unbearable calamity if the two Canadian roads which could not earn their fixed charges went into receivers' hands. But this urging was half-hearted and, when it came to a vote, they followed the lead of those who held that receivership must be averted at any cost."

See also paragraphs on *Communications* under the various countries.

**RAILWAYS, ELECTRIFICATION OF.** See ELECTRIC RAILWAYS.

**RAILWAYS, ELEVATED.** See RAPID TRANSIT.

**RAINFALL.** See METEOROLOGY.

**RAMSAY, SIR WILLIAM.** A British chemist, died at Hazlemere, Buckinghamshire, July 23, 1916. He was born in Glasgow Oct. 2, 1852, the son of a civil engineer. After graduating from Glasgow University, he studied at Tübingen, returning to his alma mater in 1874 as a tutor. From 1880 to 1887 he served as professor of chemistry at University College, Bristol, of which institution he was also principal for six years; but his main work was done at University College, London, where he held a chair till his retirement in 1913. Professor Ramsay was best known for his success in transmutation of metals. In 1907 he announced that through the use of radium he had produced a copper compound from sodium, lithium, and potassium. With Lord Rayleigh, he discovered argon, a new constituent of the atmosphere. For their achievement the two scientists were awarded the 1904 Nobel prize in physics. Other of Professor Ramsay's discoveries included the atmospheric gases neon, krypton, and xenon, and helium, a constituent of certain minerals. His writings, concerned with his researches, were published as papers in learned journals. The value of his work was recognized by his election to honorary membership in many of the great royal academies of Europe, and to other learned societies, by various foreign orders, including

the Legion of Honor (officer), by honorary degrees, and by knighthood (K.C.B., 1902). He lectured in the United States at Johns Hopkins University and before Lowell Institute, Boston, and in Italy before the Chemical Institute of Rome, when King Victor Emmanuel heard him discuss the subject of transmutation. Professor Ramsay was doubtful whether his discoveries would lead to the conversion into gold of one of the baser metals, the great aim of the alchemists, and he stated that the cost would be prohibitive; but he opened up a new field of research in his science.

**RAMSEY, JOSEPH.** An American railroad builder and official, died at East Orange, N. J., July 7, 1916. Born at Pittsburgh, Pa., and educated at the Western University of Pennsylvania (now University of Pittsburgh), he identified himself early with the construction of railroads, making a reputation in 1873-79 as chief engineer and superintendent of the Beh's Gap Railroad in Pennsylvania. This road, in eight miles, climbs 1200 feet, makes curves of 28 degrees, and has a large amount of trestle work. Afterward, till 1890, he was connected with various railways as engineer, and in the year named became assistant to the president of the Cleveland, Cincinnati, Chicago, and St. Louis. Thereafter his duties were largely executive, as president of the Peoria and Pekin Union Railway, vice-president of the Cincinnati, Wabash, and Michigan, general manager of the C. C. C. and St. L., etc. In later life he was mainly identified with the Wabash, as vice-president and general manager (1891-1901) and as president (1901-05). During that period and afterward, however, he was at the head of other roads of less importance, at the time of his death being president of the Lorain, Ashland, and Southern.

**RANGER, HENRY WARD.** An American landscape painter, died in New York City Nov. 7, 1916. He was born at Syracuse, N. Y., in January, 1858, and was educated at Syracuse University. He studied art independently, and by travels in France, England, and Holland assimilated various styles of landscape painting. His work, at first often lacking in truth to nature, improved steadily in technical skill, breadth, and feeling until finally he became known as the dean of American landscape painters and as a leader of the Tonal School. His favorite subjects were the hillsides and woods of New England. His best known paintings are "Spring Woods" and "High Bridge" in the Metropolitan Museum, New York; "Sheep Pasture," Pennsylvania Academy; "Top of the Hill," Corcoran Gallery, Washington; "Bradbury's Mill Pond, No. 2," and three other landscapes in the National Gallery, Washington. Several of his landscapes are to be found in European galleries. He received gold medals at Charleston in 1902, at Philadelphia in 1907, and in 1906 was elected National Academician.

**RANKIN, JEANNETTE.** The first woman member of Congress, was elected in November, 1916, representative at large on the Republican ticket for Montana to the 65th Congress. She was born in 1882 on a ranch near Missoula, Mont., graduated at the University of Montana, studied singing in Seattle, and afterward took a course in the School of Philanthropy in New York City. She early became interested in the woman suffrage movement and in prohibition and is an effective campaign speaker. After

leaving the School of Philanthropy, she went to the Pacific coast and prepared herself for systematic work in the woman suffrage cause, studying in the University of Washington at Seattle. She toured that State, speaking in the mining and lumber camps, and appearing also before the Legislature when the suffrage amendment was submitted to the State. She was elected president of the suffrage organization in Montana. She is deeply interested in social welfare work and the care of children. Her election was in part attributed to the woman suffrage vote.

**RANOUS, DOBA KNOWLTON.** An American editor and author, died in New York City Jan. 19, 1916. She was born in Ashfield, Mass., in 1859, her maiden name being Thompson, and at 20 joined the famous Daly's Theatre company in New York. Two years later she was married to William V. Ranous, and retired from the stage. After her husband's death, she turned to editorial work for a firm that published text-books, and later edited, and in large part translated, sets of books issued in sumptuous editions. These included the works of Maupassant, Daudet, Flaubert, and Disraeli. In collaboration with Rossiter Johnson she edited *The Literature of Italy* (16 vols., 1906), herself translating several volumes. Mrs. Ranous's work as a translator showed not only understanding of the original, but ability to render it into idiomatic and graceful English. She served on the staffs of the *Century Magazine* and the *Century Dictionary*, published anonymously *The Diary of a Daly Débutante* (1910), and had read the proofs of *Good English in Good Form* (1916), before her death.

**RANUZZI DE BIANCHI, VITTORIO AMEDEO, CARDINAL.** See ROMAN CATHOLIC CHURCH.

**RAPID TRANSIT.** NEW YORK. On Dec. 31, 1916, construction contracts, under the Dual System plans, had been awarded for 81 out of the 87 sections into which the work was divided, and including lines which lie in four of the five boroughs of the city. Progress had been made so that several new lines probably could be opened in 1917, including the Lexington Avenue and the Seventh Avenue lines. Contracts to be let included two sections of the Nassau Street link, connecting the Chambers Street terminal of the Brooklyn Rapid Transit system with the Whitehall Street tunnel, and the section of the Steinway tube at 42nd Street, from Park to Seventh avenues.

The diagonal station at 42nd Street and Park Avenue where the Lexington line joins the older subway was well enough along to warrant the hope that the line on Lexington Avenue might be open for operation in the autumn of 1917 and it was hoped that by that time the lines on Jerome Avenue and White Plains Road could be opened. On the Seventh Avenue line many of the sections were finished.

The Astoria extension in Queens, connecting with the Steinway tunnel and the Second Avenue elevated line, was nearing completion. The Broadway subway in Manhattan, much of which was finished, might be opened between the Battery and 14th Street in 1917, but it was thought more probable that the partial service would extend south only to Canal Street, where there was to be a crosstown connection with the bridges. The new Jamaica Avenue elevated extension of the Broadway line from Crescent Street, Cypress Hills, Long Island, was so far

advanced that within a few months it could be operated as far as Walnut Street. The New Utrecht Avenue line was put in operation in the summer of 1916 for practically its whole length, and was to be connected to the new terminal at Coney Island before the rush of summer traffic began.

The total estimated cost of construction of city owned lines included in the Public Service Commission's plans was approximately \$252,000,000. Of this sum the city was to provide about \$180,000,000, the Interborough Rapid Transit Company \$58,000,000, and the New York Municipal Railway Corporation (Brooklyn Rapid Transit Company) \$14,000,000. The total amount of work on the new lines completed, under construction, and under contract on Dec. 31, 1916, aggregated \$196,279,000, while in addition, about \$15,000,000 had been spent for real estate, and the two corporations that were to operate the system had expended or let contracts for about \$35,000,000 worth of work in connection with the lines which they own, besides about \$20,000,000 for equipment.

One event of the year was the resignation of the chief engineer of the Public Service Commission in charge of the subway construction, Alfred Craven, who had been connected with the work since 1900. Mr. Craven was retained, however, as consulting engineer and D. L. Turner, formerly deputy engineer of subway construction, was made acting chief engineer.

**BOSTON'S SUBWAY EXTENDED.** Direct rapid transit from the South Union Station, Boston, to Harvard Square, Cambridge, Mass., was made possible towards the end of the year by the equipment and operation by the Boston Elevated Railway Company of the portion of the Dorchester tunnel in Summer Street between the South Station and Washington Street. The Dorchester tunnel, which is an extension or continuation of the Cambridge subway, begins at "Park Street Under" station beneath Boston Common and continues easterly under Winter Street and Summer Street to and through Dewey Square, where a notable station known as "South Station Under" was built, capable of accommodating the large crowds that inevitably would concentrate at this terminal, requiring unusual equipment in the way of entrance and exit openings and escalators. From Dewey Square the Dorchester tunnel turns in a southerly direction, running through a part of South Boston to Andrew Square. This tunnel, from the Cambridge subway at Tremont Street to and including the Washington Station near Washington Street, was opened to travel on April 4, 1915. The part recently put in service in 1916 adjoins this section and extends to the new station in Dewey Square.

**CHICAGO'S RAPID TRANSIT SCHEME.** The commission consisting of William Barclay Parsons, Robert Ridgway, and Bion J. Arnold, appointed to consider and recommend a plan for rapid transit for the city of Chicago, submitted its report to the city council on Dec. 21, 1916. The commission has laid out a nine-year programme calling for an expenditure of \$100,000,000 for construction and equipment. The proposed plan involves the construction of a double-track rapid transit subway six miles in length and a five-mile subway for street surface cars, to relieve congestion in the business district. The first named subway would be built

in State Street from 18th Street to Chicago Avenue and would connect with the Northwestern and South Side elevated lines. The subway for surface cars would be a loop under Jackson and Washington streets and Michigan Boulevard. These two subways only represented a beginning and would be extended. Extensions to the elevated railway lines of the city would be made, aggregating 65 miles of single track. The elevated lines would be converted into structures capable of furnishing high speed express service in place of the local service they were accommodating. The network of street railways would be increased by 150 miles of new line, and 111 miles of old lines would be reconstructed. Eventually, the rapid transit subway would have a total trackage of 58 miles.

The commission recommends that a single corporation be organized under municipal control to operate all the passenger transportation of the city—surface, elevated, and subway—and give universal transfers. The present elevated railway system would be extended by the construction of additional lines, and the building of new lines so as to give three through north-and-south routes, located on Market and 5th streets and Wabash Avenue. There would be one four-track line through the business district and two double-track lines in the western part of the city. On the elevated loop the grades would be separated at the intersection of the east-and-west and north-and-south lines to increase the safety of operation and avoid delays. The present elevated loop would be extended so as to cover the entire central business district.

Other subways were to be built for the two east-and-west elevated lines, with a connecting terminal loop and were to be at a different level from the north-and-south subways.

At a later date an extension was to be added to form an independent north-and-south subway line from 63rd Street to Belmont Avenue.

The ultimate plan involves the expenditure of \$260,000,000 and provides for 58.1 miles of subway of which 53 miles would be for rapid transit. This amount would be distributed over some 40 or 50 years and from the profits the invested capital of the corporation would be paid back.

Under the financial plan proposed by the commission it was hoped that by 1937 there would be amortized actually or in effect nearly \$120,000,000, or 30 per cent of the then total capital investment. The continuation of this forecast indicated that by about 1947 not only would all of the additional capital to be furnished by the corporation be paid off, but the operation of the amortization fund and the city's traction fund would probably begin to reduce the original 1916 valuation of the combined properties. Possibly by the year 1960 the whole of the corporation's then investment would be retired and Chicago would then become the actual owner in fee of a combined system of subway, surface, and elevated railroads, to lease or operate as it pleased, which would be maintained at full efficiency and have cost at least \$490,000,000.

**SEATLESS CARS.** In some of the London rapid transit lines during the periods of congested traffic it was found impossible to increase either the number of trains or the length of trains and station platforms. The cars operated by the District Railway accommodated 48 passengers seated with almost as many more standing, to

the discomfort of themselves and those sitting. Accordingly it was proposed during the year to remove all seats, supply posts and rails and straps and increase the number of doors. In this way it was believed that for short runs the number of passengers could be nearly doubled without any greater discomfort.

**RASMUSSEN, KNUD.** See POLAR RESEARCH, Arctic.

**RASPUTIN, GREGORY.** A Russian monk, murdered in Petrograd on the night of Dec. 31, 1916. He was born about 1873 in Siberia and in 1905 first became known in Petrograd while promoting the revival of the cult of an ascetic sect of flagellators. At one of the meetings in behalf of this revival, which was under the patronage of members of the nobility, he attracted the attention of Emperor Nicholas II and soon became a visitor at his palace at Tsarskoe-Selo. He is said to have interested the Emperor both by his mysticism and by his practical aid in making the Russian peasant turn from vodka to work and domestic duties. Reports of his political intrigues and of a private life inconsistent with the monkish profession soon made him an object of dislike and suspicion among the Russian upper classes and also among those who were struggling in behalf of constitutional government. Plots were made to assassinate him and in July, 1914, he was stabbed by a woman at Tyumen, Siberia, and his recovery was due to the skill of the court physician sent by the Empress. After the outbreak of the European war his name became widely known as a trusted adviser of the Emperor, and he was believed to have a dominating influence at court. About 1906 he had become an associate of one Manasevick-Manuilov and befriended the latter in his intrigues. When, chiefly through Rasputin's influence, the reactionary Stürmer became premier, Manuilov became his private secretary and acted as an intermediary between Stürmer and Rasputin. The two came to be considered as "dark forces," pro-German in sympathy, hindering popular efforts in the war against the Central Powers, and cooperating to frustrate all attempts toward constitutional government. The arrest of Manuilov for bribery was to be followed by a trial on Dec. 28, 1916, in which sensational disclosures were expected, among others certain negotiations between Stürmer and the German government. The trial, when about to begin, was suddenly stopped by an order from the Emperor. This was believed to be due wholly to Rasputin's influence. He was enticed to a house by certain influential persons and was murdered, his body being thrown into the River Neva, where it was found next day.

**RAT-BITE FEVER.** This disease has long been recognized in Japan as a definite pathological entity. Investigators attached to the Imperial Japanese Institute for Infectious Diseases have identified a spirochete as the probable cause of this disease. The spirochete was isolated from the blood of two well-defined cases. The organism is described as larger than the *Spirochaeta pallida*, but smaller than the *Spirochaeta* of Dutton and Obermeyer. One of the patients recovered under treatment with mercury, the other under salvarsan. Rat-bite fever resembles in its characteristics the disease due to the spirochetes mentioned and like them responds to mercury and salvarsan.



F. G. Blake, of the Peter Bent Brigham Hospital in Boston, has described a fatal case of rat-bite fever from the blood of which during life he isolated a streptothrix in pure culture which was apparently identical with the *Streptothrix muris rattii* described by Schottmüller in 1914. Blake not only isolated the organism, but observed the development of a powerful agglutinin in the patient's serum for the streptothrix, and necropsy revealed an ulcerative endocarditis, produced by a streptothrix. The streptothrix is described as a branching filamentous organism, varying in length and having a tendency to break up into forms resembling bacilli and cocci. The filaments themselves may be either straight or curved, and take up readily the ordinary bacterial stains.

Wilder Tileston of New Haven also reported two cases in 1916, one a typical the other an abortive case, both of which recovered under salvarsan, and showed the presence of streptothrix in the blood.

**RATES, RAILWAY.** See RAILWAYS.

**RAYMOND, BRADFORD PAUL.** An American educator, died at Middletown, Conn., Feb. 27, 1916. Born at Stamford, Conn., in 1846, and educated at Hamline University, Lawrence University (A.B., 1870), and Boston University (B.D., 1873), he held Methodist charges in New

England for a decade, also studying for a year in Germany during this period. In 1883 he became president of Lawrence University, and in 1889 president of Wesleyan University, at Middletown, Conn. This latter office he held till 1908, subsequently serving as professor of ethics and biblical literature. Northwestern and Yale gave him the honorary degree of D.D. and Lawrence that of LL.D. While he was a student at Hamline University the institution would have had to close before the end of the year because of financial troubles had Dr. Raymond not hired the buildings and conducted it himself. He published *Christianity and the Christ*.

**RECALL.** See ELECTORAL REFORM.

**RECEIVERSHIPS.** See RAILWAYS.

**RECLAMATION.** No new reclamation projects were actually taken up within the fiscal year 1916. The irrigated acreage remained, therefore, about the same as in the previous year or about 860,000 acres. There were 20,000 irrigated farms, on which crops valued at \$19,000,000 were raised. The great Arrowrock dam on the Boise project in Idaho was completed during the year. This furnishes storage on the Boise River to the amount of 250,000 feet. There is sufficient water supply for 20 to 30 additional acres of land. Arrangements were made on the Lawton branch in Oklahoma. There has been

IRRIGATION AND CROP RESULTS ON GOVERNMENT PROJECTS, 1915 a

Project	Irrigable acreage b	Irrigated acreage	Cropped acreage c	Value of crops	
				Total c	Per acre cropped
Salt River .....	d 219,691	d 179,850	171,832	\$3,661,769	\$21.81
Yuma .....	72,440	27,857	25,101	873,721	34.81
Orland .....	20,820	8,928	6,980	220,422	31.81
Uncompahgre Valley .....	65,000	41,468	40,553	1,044,915	25.76
Boise .....	150,000	76,705	69,818	1,526,873	21.87
Minidoka .....	120,000	83,562	77,008	1,725,515	22.41
Huntley .....	30,813	18,208	18,185	535,368	29.41
Milk River .....	22,200	4,192	3,887	51,249	13.18
Sun River .....	16,826	4,261	4,248	e 80,000	e 19.00
Lower Yellowstone .....	42,829	12,656	11,990	194,011	16.18
North Platte .....	129,714	70,007	68,180	1,263,617	18.55
Truckee-Carson .....	65,000	40,295	38,495	592,523	f 15.39
Carlisbad .....	24,796	13,470	11,322	245,684	21.70
Hondo .....	8,330	1,294	1,287	17,773	18.81
Rio Grande .....	45,000	33,876	32,246	1,103,389	34.22
Umatilla .....	17,000	5,806	3,603	104,658	29.04
Klamath .....	38,000	27,254	27,254	877,488	18.85
Belle Fourche .....	78,591	44,067	43,063	462,050	10.72
Okanogan .....	10,099	7,800	4,814	254,425	52.60
Yakima:					
Sunnyside unit .....	g 82,757	g 66,607	54,919	2,750,326	50.08
Tieton unit .....	34,000	22,000	18,100	668,650	37.00
Shoshone .....	42,816	25,753	24,883	410,031	16.51
<b>Totals for irrigated areas covered by crop reports .....</b>	<b>1,380,223</b>	<b>814,906</b>	<b>757,613</b>	<b>18,164,452</b>	<b>24.00</b>
<b>Additional irrigated areas not covered by crop reports:</b>					
Boise h .....	80,000	20,422	.....	.....	.....
Uncompahgre Valley i .....	4,500	4,500	.....	.....	.....
North Platte j .....	8,050	8,050	.....	.....	.....
Strawberry Valley k .....	50,000	8,900	.....	.....	.....
<b>Total, reclamation projects .....</b>	<b>1,472,772</b>	<b>856,778</b>	<b>.....</b>	<b>.....</b>	<b>.....</b>

a Data are for calendar year (irrigation season) except on Salt River project, Ariz., data are corresponding "Agricultural year," October, 1914, to September, 1915.

b Area Reclamation Service was prepared to supply water.

c Irrigated crops. Excludes small areas on few projects cropped by dry farming.

d Includes 4239 acres, total area of towns contracting for water; farm area irrigated, 175,111 acres.

e Estimated. Crop reports covered 164 irrigated farms with 665 acres cropped, of which 2422 acres were not irrigated. Total crop value for 6665 acres, \$115,120, or \$17.29 per acre.

f \$22.60, excluding native pasture and other fields not in full production.

g Exclusive of Sunnyside and Snipes Mountain irrigation districts for which construction was largely completed during the year and small amounts of water delivered.

h Nampa-Meridian and Pioneer Irrigation districts; New York Canal Co. lands.

i Under private canals supplied Gunnison water.

j North Platte Canal and Colonization Co. lands. In addition stored water was delivered to a number of private canals under the terms of the Warren Act.

k Government furnished stored water to supplement insufficient normal flow rights of Lake Shore and Spanish Fork units and Clinton district.

difficulty in securing sufficient compact areas to permit economical irrigation, owing to the unwillingness of some of the land owners to subdivide and sell their holdings. The accompanying table gives a list of the projects and the crop results in 1915.

See IRRIGATION.

**RED CROSS, AMERICAN NATIONAL.** The report of Mr. Eliot Wadsworth, acting chairman of the central committee of the American Red Cross, for the year 1916 was presented at the annual meeting in Washington, December 13th. It demonstrates that in this, the twelfth year of the organization, its activities were extended further than in any previous period. Beginning on Dec. 8, 1915, the work was divided between the Department of Civilian Relief, with Mr. Ernest P. Bicknell as director general, and the Department of Military Relief, Col. Jefferson R. Kean, Medical Corps, U. S. A., director general. Especially important was the part that the latter department took in the movement for preparedness in the United States (see below). During the year the Red Cross saw an extraordinary increase in membership from 22,500 on Dec. 1, 1915, to 286,400 on Dec. 1, 1916. Campaigns for new members were carried on in the larger cities and 100,000 new members were added in greater New York alone. The number of chapters increased from 145 to 250.

The treasurer, the Hon. John Skelton Williams, reported total cash receipts for the 11 months ending Nov. 30, 1916, of \$1,544,245.43, an increase over 1915 of \$786,081.66, and total cash disbursements of \$1,352,099.46, an increase over 1915 of \$485,150.19. Of the receipts, 30 per cent were devoted to the European War Relief Fund and 16 per cent to the Preparedness Fund. It was reported that the circulation of the monthly magazine which is the official organ of the American Red Cross had increased in 1916 from 25,000 to 230,000. During the year a new building, to be occupied by the society, was under construction and it was expected that it would be completed early in 1917. At the annual meeting all the officers for 1916 were re-elected as follows: President, Woodrow Wilson; vice-president, Robert W. De Forest; secretary, Charles L. Magee; treasurer, John Skelton Williams; and chairman of the central committee, William H. Taft.

**DEPARTMENT OF CIVILIAN RELIEF.** *European War Relief.* As in 1915, a large part of the activity of the Red Cross was devoted to European war relief, to some slight extent military, but chiefly civilian. For this purpose there was received (January 1st-December 1st) \$706,234.79 and \$681,396.27 was paid out. Each month \$1000 was sent to the American War Relief Clearing House in Paris. In addition, great quantities of supplies were received and shipped. The total value of all shipments in 1916 was \$558,560.25 as against \$786,488.26 in 1915. This falling off was ascribed to the fact that since January, 1916, the general policy of the Allied governments prevented the shipment of supplies to the Central Powers unless they were to be used by American Red Cross hospital units. Arrangements were made to establish two such units in Austria-Hungary, but no agreement was reached with the German government. It was believed by the American Red Cross that the status of all neutral Red Cross societies during the present war and in the future would be

largely affected by the reestablishment of a channel for sending relief supplies to the Central Powers.

Mr. Bicknell, director general of the Department of Civilian Relief, in reporting on the aid rendered to civilian noncombatants in the war-stricken countries, emphasized the difficulties that had to be met where the wishes, regulations, and restrictions of belligerent governments had to be constantly consulted. The work of the Red Cross Commission in Serbia was stopped by the invasion of the Teutonic Allies in December, 1915. The members of the commission separated and found other fields of service, along the Albanian coast, in the Island of Corfu, and in Greece. Mr. Edward Stuart, chairman of the commission, after permission to enter southern Serbia had been refused, went to Vienna and arranged with the government to provide relief for the destitute population of northern Serbia. Accordingly, food supplies were purchased in Rumania and sent down the Danube to Belgrade, but upon the declaration of war by Rumania this avenue was cut off. However, 300 tons of supplies (food and clothing), in storage at Marseilles, France, were transported across France, Switzerland, and Austria to Belgrade and distributed. Altogether, 318 carloads were distributed during the summer and autumn. Before the end of the year, the Austrian government had asked the commission to withdraw from Serbia.

The Red Cross found it impossible to undertake any comprehensive relief organization in Poland. All attempts to obtain the consent of the Allied governments and the governments of the Central Powers for such relief failed. Through various channels—local committees, etc.—money contributions for Polish aid were made by the Red Cross to the amount of \$58,938.05. Funds collected by various Lithuanian agencies on Lithuanian day (November 1st) were turned over to the Red Cross. It was expected that the total would be not less than \$150,000. The sum of \$60,000 was sent to Constantinople for relief in that city and other communities under Turkish rule. Great difficulty was found in forwarding supplies or money for Armenian relief, but Red Cross committees in Persia and Egypt cared for a number of Armenian refugees. The acute distress in Syria was relieved only after a direct request by President Wilson had induced the Turkish government to permit importation and distribution of supplies to the starving inhabitants. In the United States October 21st and 22nd were fixed by the President as Armenian and Syrian days and a large sum of money was realized. Space for 2000 tons of relief supplies was granted by the Navy Department in the collier *Cesar*, which was to carry coal to an American warship in the Mediterranean. By this "Christmas ship" the Red Cross sent hospital and medical supplies valued at \$22,000.

*Other Civilian Relief.* The Department of Civilian Relief also has under its charge the relief of communities overwhelmed by disaster, a Town and Country Nursing Service, and the Red Cross Christmas seals. No spectacular disasters drew heavily upon the resources of the organization during the year, but in various countries and States of the United States by fire, flood, cyclone, tornado, or famine many thousands of persons were placed in need of re-

lief. The contingent relief fund expended for such sufferers amounted to \$11,257.31. A special service performed in 1916 was the relief of families of national guardsmen called to the Mexican border. Eventually an appropriation by Congress was made available for this purpose, but before that a total of at least \$100,000 had been donated by the Red Cross. The Town and Country Nursing Service, of which Miss Fannie F. Clement is superintendent, reached by correspondence 163 communities, an increase of 84 over 1915. On December 1st, 66 Red Cross nurses were at work in 21 States, 22 more than in the preceding year. They recorded 10,286 cases and 112,836 visits. During the year 17 nurses entered on special courses in preparation for Town and Country Nursing work.

The activity of this service has proven itself increasingly beneficial to small towns and rural communities where expert nurses are seldom found. It was reported that the sale of the Red Cross Christmas Seals, the proceeds of which support a large share of the anti-tuberculosis work of the country, yielded \$750,000 in 1915, as compared with \$4500 in 1907, when the seals first appeared. The total receipts from this source have amounted to \$3,200,000.

**DEPARTMENT OF MILITARY RELIEF.** This important department of Red Cross work was created by the revised by-laws adopted Dec. 8, 1915. In the words of the director-general of the department, Colonel Kean, "The object of its creation was to furnish the machinery by which the American National Red Cross could carry out the purposes of its charter so far as concerned the furnishing of volunteer aid to the sick and wounded of armies in war and as a medium of communication between the people of the United States and their army and navy. It includes the Bureau of Medical Service, the Bureau of Nursing Service, and the Bureau of Supplies. It has supervision of all the work of the chapters relating to the various branches of military relief work, such as European war relief, assistance to our own soldiers, instruction in first-aid and home care of the sick, etc. It deals directly with the military units, such as base hospitals, ambulance companies, hospital units, surgical sections, supply depots, and naval and emergency detachments of nurses which are organized with the approval of the medical department of the army and navy to reënforce these services in case of war. It administers also all agencies of assistance to the sick and wounded soldiers of foreign countries and to prisoners of war."

Deploing the inefficient and spasmodic form of Red Cross work represented by volunteer aid as given in the earlier years of the organization's history, Colonel Kean remarks in his report that plans for relief in times of emergency are still in a chaotic condition in the United States. "We are confronted," he says, "with the absurd spectacle of 130 different organizations advancing their claims to be the accepted agencies of the American people for the purpose of European military civilian relief, while several associations have assigned to themselves work with reference to our own military services, which is, by the proclamation of the President of the United States, authorized only for the American Red Cross or through its agency. The conception of profitable Red Cross assistance, which is now accepted in European countries, and in

Japan, is that in which it comes, in time of war, entirely under the control of the Military Medical Service . . . (which is) not only desirable but absolutely necessary under the conditions of modern warfare."

**Base Hospitals.** Colonel Kean reviewed the history of efforts to create Red Cross units which should be of service if the United States were engaged in war. It is only since December, 1915, that it has been possible, through the development of the Department of Military Relief, to give substance to earlier plans. In discussing the military service for the rescue of the wounded of armies in the field Colonel Kean described three zones—the Zone of the Front, that of the Base, and that of the Home Country and stated that of this structure the Base Hospital was the central span and the most important contribution which the Red Cross could make for the safety and comfort of the wounded. He stated that, although immediately and urgently needed as soon as war was declared, the difficulties of securing personnel and equipment for so complex an organization had hitherto prevented providing for it in time of peace. During 1916, however, important progress was made in the organization of Red Cross units from the staffs of physicians and nurses in civil hospitals. Medical equipment for each hospital costing \$25,000 is provided by the Red Cross, and committees of women contribute various supplies valued at \$8000. Although the Field Service regulations of the United States army require that every division of troops should have at least one base hospital of 500 beds, at the beginning of 1916 no base hospital was in existence in this country. During the year, however, 21 base hospitals were created for the army and four others authorized. Three were created for the navy, in Brooklyn, Philadelphia, and Los Angeles. The storage of equipment for such hospitals presented a difficult problem, 1900 cubic feet being required for each lot of supplies. The New York units, and possibly others, were authorized to use the buildings at the un-garrisoned post of Fort Schuyler on Long Island Sound.

A significant demonstration of what had been accomplished was given in October when Base Hospital No. 4, at Lakeside Hospital, Cleveland, Ohio (of which Dr. George W. Crile is director), was mobilized in Fairmount Park, Philadelphia, at the time when the Clinical Congress of Surgeons, the American College of Surgeons, and the National Committee on Red Cross Medical Service were all holding meetings. The camp, which covered more than 11 acres and tentage for which was loaned by the government, was erected by a detachment of the United States Medical Department under Maj. Harold W. Jones. Colonel Kean says: "The mobilization of this hospital marks an epoch in Red Cross development as concerns its obligations to assist the medical service of the armed forces in time of war." The cost of the mobilization was \$5035.75. In response to numerous requests from doctors and nurses the Red Cross secured permission from the War Department to authorize smaller units, half the size of the Base Hospitals, to be known as Hospital Units, and still smaller groups called Surgical Sections. A Sanitary Training Detachment will utilize the services of men trained in first aid. Aside from these activities the department contributed its

share toward relief abroad by sending supplies, chiefly medical. It was found that the Teutonic prisoners in Siberia were in greater need than others and most of the shipments were made to them.

Since June 1, 1916, there has been a National Committee on Red Cross Medical Service composed of 47 distinguished American physicians and surgeons. Another committee, appointed by the presidents of the five great medical associations of the United States, met under the chairmanship of Dr. William J. Mayo in Washington on April 26th and offered their services, and those of 70,000 medical men represented by them, to the President for the benefit of the army and navy. It was decided that this committee (the Advisory Committee of Civilian Physicians and Surgeons on Medical Service) should be an interlocking one with the National Committee on Red Cross Medical Service.

**THREE BUREAUS.** Detailed reports were submitted by Maj. Robert U. Patterson, Medical Corps, U. S. A., director of the Bureau of Medical Service, and by Surgeon Theodore W. Richards, U. S. N., director of the Bureau of Supplies. Miss Jane A. Delano reported as chairman of the National Committee on Red Cross Nursing Service, which met in New Orleans in May and in Washington in December. In the latter month there were 44 State committees and 71 local committees with a total enrollment of over 7600 Red Cross nurses. Of these 1600 enrolled during 1916, interest having been increased by the development of units of nurses for service in the event of war. A Bureau of Nursing Service under the supervision of the Department of Military Relief was created, with Miss Clara D. Noyes as director. The surgeon-general of the navy assigned Miss Katrina Hertzner, a member of the Navy Nurse Corps, to assist in enrolling nurses for service. See **RELIEF FOR WAR VICTIMS; UNITED STATES AND THE WAR; WAR OF THE NATIONS.**

**REDESDALE, ALGERNON BERTRAM FREEMAN MITFORD,** first Baron. A British diplomat, public official, and author, died in London Aug. 17, 1916. He was born in 1837, studied at Eton and at Christ Church, Oxford, and from 1858 was for some years in the Foreign Office and diplomatic service, stationed at Petrograd, Peking, and Tokyo. From 1874 to 1886 he held the post of secretary to the Office of Works. In 1892-95 he served as a member of Parliament. He was appointed to the Royal Commission on Civil Services and interested himself in art and educational institutions. In 1902 he was made a baron, taking an old title that had lapsed early in the nineteenth century, and in 1905 received the G.C.V.O. Lord Redesdale was called upon in 1906 to accompany Prince Arthur's mission to Japan. Among his books are: *Tales of Old Japan* (1871), which has been translated into Polish and German; *The Bamboo Garden* (he grew 40 species near his country home) (1896); *The Attaché at Peking* (1900); *The Garter Mission to Japan* (1906); *A Tragedy in Stone* (1912); *Memoirs* (1916), containing much interesting discussion of European affairs.

**REDON, ODILON.** A French painter, etcher, and lithographer, died in 1916. He was born at Bordeaux in 1840 and passed his youth in a remote part of La Gironde, where the romantic scenery and surroundings left their impress upon his character and art. Owing to ill health, his

education began late. He studied painting under Gérôme, but had a predilection for Delacroix. His art is essentially visionary, but expressed in the language of reality and shows mastery of chiaroscuro and of the rhythmic line. He was also a spirited lithographer and etcher and designed tapestries for the Gobelins. His "Les Yeux Clos" (Closed Eyes) is in the Luxembourg Gallery.

**REED, JAMES A.** Reflected Democratic United States Senator from Missouri, Nov. 7, 1916.

**REED COLLEGE.** A non-sectarian co-educational institution at Portland, Ore. In the fall of 1916 there were 280 students enrolled in the college, which provides a course in liberal arts and sciences leading to the degree of A.B. There were 21 members in the faculty. During the year Dr. Joseph A. Hart, formerly professor of education in the University of Washington, was added to the teaching staff. Reed College has an estimated endowment of \$3,000,000. The library contains 12,000 volumes. President, William Trufant Foster.

**REFERENDUM.** See **ELECTORAL REFORM.**

**REFORMED CHURCH IN AMERICA (DUTCH REFORMED).** This denomination in 1916 had 130,943 communicants, an increase of 4096 over 1915; 724 churches; and 745 ministers. For administrative purposes it is divided into four particular synods and 35 classes corresponding to the presbyteries in the Presbyterian Church. The Sunday schools had an enrollment of 131,890. The denomination contributes annually for benevolent and missionary purposes about \$500,000, and for congregational purposes about \$1,700,000. Its missionary work is in charge of the board of foreign missions, the women's foreign mission board, and the domestic missionary board. The board of education and board of publication regulate educational and publishing interests. The officers of the general synod are Peter Moerdyke, president; Henry Lockwood, stated clerk; Clifford P. Case, permanent clerk. The general synod meets at Asbury Park, N. J., in June, 1917.

**REFORMED CHURCH IN THE UNITED STATES,** known also as the **GERMAN REFORMED CHURCH.** This denomination had in 1916, 326,112 communicants, an increase of 5653 over 1915; 1773 churches; and 1245 ministers. The affairs of the denomination are administered by nine district synods, and 61 classes, corresponding to the presbyteries in the Presbyterian Church. The Sunday schools had, in 1916, over 316,832 pupils. The missions of the Church are carried on in practically all the States of the Union and in Canada. Theological seminaries are maintained at Lancaster, Pa., and Dayton, Ohio. The colleges include Franklin and Marshall College, Lancaster, Pa.; Heidelberg College, Tiffin, Ohio; Ursinus, Collegeville, Pa.; Mission House, Sheboygan, Wis.; and Catawba College, Newton, N. C. Colleges for women are maintained at Frederick, Md., and Allentown, Pa. The headquarters of the publication and Sunday school and mission boards are in Philadelphia, Pa.

**REFORMED EPISCOPAL CHURCH.** The administrative affairs of this denomination are under the control of six bishops. Foreign missions are carried on in India, and among the colored people of South Carolina domestic missions are maintained. There is a theological

seminary in Philadelphia, where the denominational organ, the *Episcopal Recorder*, is published. According to the latest available returns (1913) there were 83 ministers, 80 churches, and 10,800 communicants.

**REFORMED PRESBYTERIANS.** There are five branches included under this title: the Associate Reformed, South; the Reformed (Synod); the Reformed (General Synod); the Reformed (Covenanted); and the Reformed in the United States and Canada. The Associate Reformed, South, is the largest branch. It had, according to the latest available statistics (1915), 15,821 communicants, 155 churches, and 113 ministers. The Reformed (Synod) had 8634 communicants, 111 churches, and 128 ministers. The Reformed (General Synod) had 3300 communicants, 17 churches, and 16 ministers. The Reformed (Covenanted) had 40 communicants and 1 church. The Reformed in the United States and Canada had 360 communicants, 1 church, and 1 minister. The Reformed (General Synod) maintains two churches in India. It maintains a theological seminary in Ohio and a college at Cedarville, Ohio.

**REFRIGERATION.** Like other fields of mechanical engineering there was a pronounced tendency in refrigeration plants in 1916 to secure greater economies through more efficient engines for compression, employing those of the uniflow and high grade poppet valve types. At the same time there was an advance in multi-stage systems of compression, which, in the case of the Davis two-stage system, served to reduce the range of operating pressures in each cylinder and thus secure greater volumetric efficiency, with an estimated saving of 30 to 50 per cent in steam per ton of refrigeration. Multi-stage compression opened up great possibilities, as there were found to be the same opportunities for greater efficiency in the compression of ammonia as in the case of air, where much power was saved by multi-stage compression. An interesting paper in this field was read at the 12th annual meeting of the American Society of Refrigerating Engineers by Harry Sloan.

**REFRIGERATOR CARS.** See **HORTICULTURE.**

**REFUSE DISPOSAL.** See **GARBAGE AND REFUSE DISPOSAL.**

**REGER, MAX.** A German composer, died at Jena May 12, 1916. He was born at Brand, Bavaria, in 1873, and studied under his father and Lindner, and later for long under Riemann. While still a student he taught in the conservatory at Wiesbaden, and later, after some years at Weiden, which had become the home of his family, he went to Munich. Here he taught counterpoint at the Royal Academy in 1905-06, and thereafter till 1911 resided in Leipzig, as music director and professor at the university, teacher at the conservatory, and conductor. From 1911 he had been court conductor of the Meiningen Orchestra, a celebrated organization. Reger began early to compose, and was so prolific that at 34 he had produced 100 works. The University of Jena gave him an honorary degree of Ph.D. His compositions are especially noted for their complexities, and it is as a contrapuntist, especially in music for organ, that he resembles Bach. In Germany he became very popular. Reger wrote, besides works for organ, choral works with orchestra, chamber music, piano works, and 300 songs.

**REGULAR ARMY.** See **MILITARY PROGRESS.**

**REHAN, ADA.** An American actress, died in New York City Jan. 8, 1916. She was born in Limerick, Ireland, April 22, 1860, but her family came to New York when she was a child and settled in Brooklyn. The name was originally Crehan. Two of Ada Rehan's sisters went on the stage, one of them marrying Oliver Doud Byron, a well-known actor of the time, and two brothers became theatrical managers. When she was 14, she made her first appearance in Newark, N. J., in the Byrons' company presenting *Across the Continent*. Later, for some years, she gained experience in stock companies in Philadelphia (Mrs. John Drew's Arch Street Theatre), Baltimore, Albany, and Louisville. In the Albany company she is said to have played some 90 characters, among them Ophelia to Booth's Hamlet and Lady Anne to John McCullough's Richard III. But her period of blossoming and of great success began when Augustin Daly engaged her in 1879 for the company with which he opened Daly's Theatre in New York. With him she remained till his death, 20 years later. This period has been called the "golden age" in American theatrical achievement, and Daly was the prince of managers. Of him and of Miss Rehan, William Winter, one of the actress's most ardent admirers, says in *Vagrant Memories* (1915): "Daly rendered many, various, and important services to the theatre of his time, but his recognition and development of the genius of Ada Rehan were the most valuable of them all. In Ada Rehan the stage was illumined and graced by an actress who not only preserved, but bettered, the brilliant traditions of Peg Woffington and Dora Jordan. Her rich beauty, her imposing stature, her Celtic sparkle of mischievous piquancy, her deep feeling, her round, full, clear, caressing voice, her supple freedom of movement, the expressive play of her features, and the delightful freedom and vivacity of her action—who that ever appreciated could ever forget them? She raised the character of Shakespeare's Shrew from the level of turbulent farce, and made it a credible, consistent, continuously interesting, and ultimately sympathetic image of human nature. She was the best Rosalind ever seen in our time, or, as far as extensive reading on the subject enables me to judge, since *As You Like It* was written, and I confidently believe that within her special field—of archness, raillery, sentiment, coquetry, and noble woman-like feeling—she has seldom been equaled and never excelled."

As noted in this description, Miss Rehan became most famous for her Katharine and her Rosalind, but she also played a wide range of parts in Shakespearean comedy, as Viola, Portia, Miranda in *The Tempest*, Beatrice, Mistress Ford, Helena in *A Midsummer Night's Dream*; in Old English comedies such as *The Critic* and *The School for Scandal*, her Lady Teazle being one of her most successful roles; and in modern comedies. In London, where she appeared at intervals, she gained great popularity and high praise from the critics. After Mr. Daly's death, she did relatively little acting. In 1901 she played in *Sweet Nell of Old Drury*, in 1903-04 she toured with Otis Skinner in Shakespearean repertoire, in 1904-05 with Charles Richman starred in Shakespeare and Old English comedy, and made her last appearance in 1905 at the

testimonial to Modjeska. After the retirement, Miss Rehan lived quietly in New York, and, until the European war, went abroad each summer.

**REINDER.** See ALASKA.

**RELIEF FOR WAR VICTIMS.** The generous contributions of the United States to the innocent victims of the European war were continued through numerous organizations in 1916. The first relief organization sprang into existence in September, 1914, on account of the ravages of the German forces in Belgium. Since that time the devastation of Russian Poland and Galicia, of Serbia, and of Armenia, and Syria brought into existence various funds either for general relief in the despoiled territories or for the special relief of particular classes of sufferers. Similar organizations were formed in other neutral countries and in various of the belligerent. By far the most important relief organization in the world has been the Commission for Relief in Belgium (see below), but the Rockefeller Foundation (see ROCKEFELLER PHILANTHROPIC BOARDS) operated over a vaster territory. Numerous devices have been resorted to for raising funds for relief bodies, including newspaper appeals, endless-chain whist parties, fairs and bazaars, theatrical and musical performances, "tag" days, balls and fetes of various kinds, and appeals to the churches and other organizations. So numerous were the relief funds appealing to the American public and so frequently did they seem to overlap that there was considerable agitation in favor of their consolidation and systematization. Late in December former ambassador to France, Myron T. Herrick, suggested that President Wilson appoint a committee of distinguished persons to have general oversight of such reorganization. He declared that the United States should raise \$1,000,000,000 during 1917 for the relief of Europe, and that America's war profits should furnish most of the fund. On December 27th representatives of 12 philanthropic associations met in New York to consider the formation of such a committee.

**COMMISSION FOR RELIEF IN BELGIUM.** This was an international organization brought into existence late in 1914 by the American and Spanish ambassadors at London, the American and Spanish ministers at Brussels, the American ambassador at Berlin, and the American minister at The Hague. Its principal offices were in London, New York, Brussels, Rotterdam, and Paris, while there were national organizations not only in those countries, but in Spain, Italy, Argentina, China, Japan, and elsewhere. There was affiliated with it a woman's section. It carried out its distribution of supplies in Belgium through the Comité National de Secours et d'Alimentation. In 1915 it extended its activities to Northern France by means of the Comité d'Alimentation du Nord de la France. Its principal office in the United States is at 120 Broadway, New York City, but it has assembling depots in every State in the Union, as well as throughout the world. It supplied free transportation for all supplies, so that any gift to it reached European recipients in full value. Herbert C. Hoover is chairman of the commission.

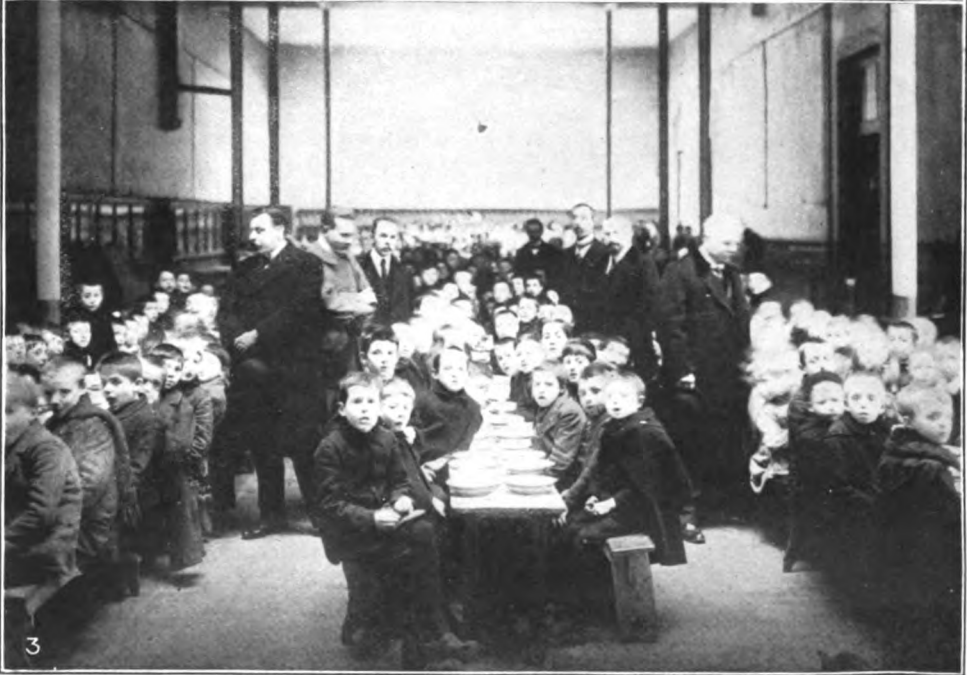
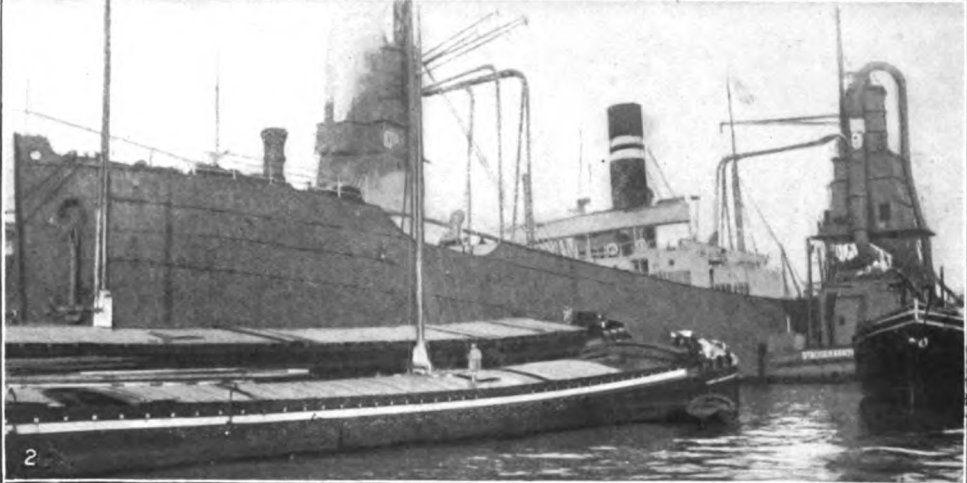
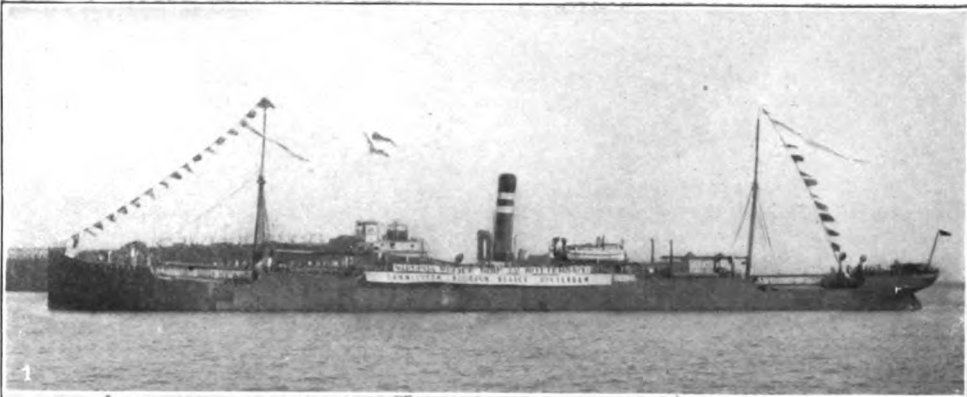
The work of the organization was carried out through three main departments: Provisioning; Financial Relief, Exchange, and Accounts; and Benevolent. The Provisioning Department endeavored to feed from 7,000,000 to 10,000,000

people in the devastated areas of Belgium and France. During the year ending Oct. 31, 1916, there was imported 1,706,774 metric tons of food into Belgium and 483,346 tons into Northern France. Nearly one-half of this food was purchased in the United States and the remainder came about equally from Argentina and the British Empire, though small quantities came from Holland and elsewhere. From Rotterdam food supplies were distributed, largely by canal, to terminal warehouses and from these to nearly 5000 communal warehouses. For purposes of food distribution the population was treated with little or no class distinction. The Provisioning Department conducted its operations on a nominal cash (paper) basis. All citizens who were able paid out of their own funds, many were assisted by local and national governments, and the destitute were supplied through the Benevolent Department with tickets or orders. The distributing organization included a federated system of "communal," "regional," "provincial," "district," and "national" committees. Over all these the commission maintained a system of inspection and accounting. There were about 3000 communal committees in Belgium and 2000 in the north of France, embracing about 35,000 volunteer workers. These committees distributed food from local canteens or stores to civilians on the basis of bread-cards and provision-cards calling for a regular daily or weekly ration. Any profit from the sale of food tickets—amounting to over \$5,000,000 the first year—is transferred to the Benevolent Department.

The Financial Relief, Exchange, and Accounts Department not only checks financial operations of the commission, but it has facilitated the payment of millions owed to Belgians by outsiders, the transfer of funds from Belgians in other countries to friends and relatives in Belgium, and the utilization of paper money received for food in making further purchases abroad. It has thus kept many families from destitution by enabling them to utilize their credit and resources.

The total amount of money entrusted to the commission during its first two years, ending Oct. 31, 1916, was \$201,782,079. During this time it actually imported into France and Belgium food valued at \$173,658,916; and had purchased additional food valued at \$28,123,163. Of these vast sums there had been advanced by the British and French governments through the Belgian government for the relief of Belgium, \$108,121,358. Various French institutions had advanced in loans to the communes and Northern France for destitute persons of Northern France \$66,155,501. Public subscriptions in Great Britain amounted to \$13,689,670; in the United States, \$8,747,138; and in other countries \$1,066,963. In contrast to the small subscriptions in the United States was the expenditure of \$100,000,000 of the commission's funds in this country. The public subscriptions in Great Britain, United States, and other countries included not only cash, but food and clothing. The overhead expense for the year 1916 was five-eighths of 1 per cent.

The Benevolent Department was that through which the charity of the world was made available for destitute Belgians and French. Its problem has steadily increased. Late in 1914 there were estimated to be in Belgium alone



1. A Relief Ship sailing from Norfolk, Va., flying flag of the Commission and having the appropriate marking on the side
2. A Steamship discharging at Rotterdam supplies purchased in the United States by the Commission
3. Feeding Belgian Children

WORK OF THE COMMISSION FOR RELIEF IN BELGIUM





1,200,000 wholly or partially destitute persons; a year later their number was 3,500,000, or nearly one-half the entire population. Their support during the year ending October, 1915, required \$54,409,000; in the succeeding year the cost had grown to \$10,000,000 per month, which was required also for 1917. In Northern France the entire population of 2,125,000 was practically destitute, but their support was provided mainly from funds secured by loans of the communes. It must be noted too that most of the funds provided for this department in Belgium were advances of the French and English governments to the Belgian government. The work of this department therefore involved a correlation of the world's charity with previously existing charitable organizations in the devastated area and the administration of funds supplied by governments. About 3000 communal charity committees were organized. These were the medium through which the worthy needy secured supplies or tickets on the public canteens of the Provisioning Department. For the wholly destitute there were provided also clothing and shelter. Every effort was made by local committees to provide self-help and by the central organization to cultivate self-reliance on the part of the communal committees. In addition special charity committees for numerous special problems due to the war were created; and a system of support of public services and special institutions to aid established organizations.

Public charity from abroad was used to aid in provisioning, clothing, and sheltering the destitute through the communal committees. It was also used to assist the following through special committees: Children, farmers, lace-workers, refugees, artists, doctors and pharmacists, the dispossessed, Belgian prisoners of war, war cripples, the tubercular, destitute young mothers, Cardinal Mercier's clergymen's fund, the Antwerp workrooms, and 20 other causes. The services maintained by government subsidy were: Allowance to families having lost bread-winners; additional allowances to the destitute; advances to families of officers; and advances to a loan society, to educational institutions, to savings banks, and to the communal governments.

It was estimated in December that there were fully 1,000,000 destitute children in Belgium alone. The cost of their maintenance during 1917 was estimated at a minimum of \$1,000,000 a month. This was only \$1 per month for each child to pay for a special noonday lunch in schools and other public institutions. The cost of feeding the remainder of the destitute population was estimated at \$9,000,000 per month; thus a total of \$10,000,000 a month was needed in 1917. The commission sent Dr. Lucas of the University of California to inspect the schools and hospitals with a view to determination of the adequacy of maintenance. He declared that while the rations supplied were sufficient to maintain both adults and children for a short period of time they were inadequate for indefinite periods. The rations failed to provide for the necessary growth of children and for the maintenance of adequate powers of resistance on the part of both children and adults. Dr. Lucas found, especially among children, many diseases clearly due to malnutrition and an alarming spread of tuberculosis.

**POLISH RELIEF.** It was recognized early in

1915 that the devastation of Poland had created a relief problem equal to or even greater than that existing in Belgium. Consequently the Rockefeller Foundation sent agents to Poland to investigate the need and to take steps toward the organization of an International Commission for Relief in Poland. A plan was formulated and signed by Dr. Theodore Lewald for the Imperial German government, Ambassador Gerard for the proposed International Commission, and Ernest P. Bicknell for the Rockefeller Foundation War Relief Commission. A German committee pledged itself to raise \$500,000 per month for food and the Rockefeller Foundation pledged \$10,000 per month to defer administrative expenses. The German and Austrian governments pledged themselves to requisition no food in that part of Poland occupied by their forces, and not to levy money requisitions on any occupied part of Russian Poland except military fines, and it was agreed that the International Commission might send its agents through any of the occupied territory. Agents of the commission thereafter visited all parts of Europe looking for available supplies of wheat, but failed of success. It became evident then that supplies must be brought in through the British blockade. For an account of the failure of the American plan for the relief of Polish sufferers, see *WAR OF THE NATIONS, Question of Polish Relief.*

**AMERICAN AMBULANCE IN FRANCE.** One of the most important of the American relief activities was the maintenance of ambulances on the western military front, and also at Saloniki. This organization was composed of 7 sections, each section having 20 ambulances, one or two staff-cars, one or two supply-cars, or about 25 cars in each section. These ambulances were used in transporting wounded from the front and especially from trains to hospitals. It was estimated that they had transported about 250,000 wounded from the beginning of the war to the close of 1916. A total of about 500 men had been in the service from the beginning of the organization, most of them college men. Thus 108 men had gone from Harvard, 40 from Yale, nearly as many from Princeton, and smaller numbers from about 35 other colleges. The ambulance also supported one of the largest hospitals at Paris. It also organized the American Relief Clearing House which became the centre of American relief work in France, and which was backed by the War Relief Clearing House at New York. There was organized also the Refuge Relief for the homeless of all nations.

**JEWISH RELIEF.** The great urgency of special relief for Jewish war victims was shown in the official proclamation of President Wilson, setting aside Thursday, January 27th, as a special day for the collection of contributions in aid of the Jewish people driven from their homes and made destitute by the war. In this proclamation the President declared that, "in the various countries now engaged in war there are 9,000,000 of Jews the great majority of whom are destitute of food, shelter, and clothing." About \$100,000 was collected on that day by organizations throughout the United States. The principal organizations in charge of the collection and distribution of the relief funds for the Jewish people have been the American Jewish Relief Commission for Sufferers from the War, organized with Felix M. Warburg, 52

William Street, New York City, as treasurer, and the Central Committee for the Relief of Jews Suffering through the War, organized largely through the activities of Leon Kaimaiky, editor of the *Jewish Daily News*, with Harry Fischel, 63 Park Row, as treasurer. This latter organization carried on a special propaganda throughout the country and collected more than \$1,500,000 in 1916. Its contributions were mostly in small sums, showing that the appeal had reached all ranks of the Jewish population. On December 21st, the anniversary of a memorable meeting in Carnegie Hall in 1915, was given a remarkable demonstration of the willingness of American Jews to aid their kinamen abroad, nearly \$3,000,000 being subscribed toward a \$10,000,000 fund which is to be completed in 1917. This fund was under the auspices of the Joint Distribution Committee, 20 Exchange Place, New York, through which various organizations interested in Jewish relief were coordinating their efforts. See also **Jews and Judaism**.

In Great Britain had been formed in 1915, the Russian Jewish Relief Fund, and in Russia, Poland, Austria-Hungary, and various places in the Near East had been formed local committees through which distribution was made. The largest sums sent by the Joint Distribution Committee had gone to Russia, German Poland, and Galicia. Nevertheless, considerable sums were forwarded to Palestine, Greece, Turkey, Alexandria, Tunis, Algeria, Morocco, to Jewish students in Swiss universities, and destitute families of Russian Jews in France. Moreover, several million dollars had been forwarded to various war zones through the joint committee's transmission bureau as remittances from friends and relatives. The committee also sought to reunite broken families, relatives, and friends.

The Federation of Rumanian Jews of America held a conference in New York City, at which plans were laid for raising \$1,000,000 for the relief and emancipation of Rumanian Jews.

**AUSTRO-GERMAN RELIEF FUNDS.** A number of organizations devoted their activity to securing funds for the relief of citizens of the Central Powers who were victimized by the war. Thus the General Relief Fund for the German War Sufferers, Charles Froeb, treasurer, 531 Broadway, Brooklyn, reported gifts of nearly \$550,000. The Teutonic War Relief Committee, 42 Broadway, raised more than \$25,000 for suffering noncombatants in Germany, Austria-Hungary, Poland, Turkey, and Bulgaria, through the sale of special stamps. The Prisoners of War Relief Fund had received about \$375,000 in cash and reported that winter outfits had been contributed for the prisoners of war in Siberia valued at over \$700,000. The American Relief, aided by a special appeal of Ambassador James W. Gerard in behalf of German widows and orphans of the war, had collected nearly \$80,000. There was in addition the American Collection for German War Orphans, of which Knaught, Nachod, and Kuhne were treasurers. The East Prussian Relief Fund, 15 Union Square, also reported contributions of many thousands. The American Physicians Expeditions to Germany and Austria-Hungary, 122 Hudson Street, with its women's auxiliary committee, collected funds for the wounded in hos-

pitals and for sending American physicians for hospital work in Germany and Austria.

**SERBIA, ARMENIA, AND SYRIA.** Among the organizations particularly interested in relief in Serbia was the Serbian Hospitals Fund, 23 East 26th Street, which collected about \$55,000 from March to the close of the year. The Franco-Serbian Field Hospital of America, 17 West 30th Street, received generous support. The Serbian Relief Committee, 70 Fifth Avenue, was the principal organization, however, securing funds for Serbian victims. Its collections to late December amounted to \$325,000.

The terrible ravages of the Turks in Armenia and Syria resulted in active sympathy on the part of the entire American nation. In both areas the Turks had terrorized the population, had deported large numbers, and killed many who were suspected of disloyalty. The extensive and intense suffering resulting therefrom caused the Government of the United States to request the Turkish government that a neutral committee be permitted to undertake relief work in the devastated areas. That government replied that such relief was unnecessary. Thereupon the State Department instructed the American chargé d'affaires at Constantinople to warn the Ottoman government that friendly relations would be disturbed unless heed were given to the request. Thereafter avenues were opened up whereby relief could be sent in. About December 1st a "Christmas ship" was dispatched to Beirut, Syria, with a cargo of food-stuffs and new clothing to be distributed by the agents of the American Red Cross and the Red Crescent with the assistance of the United States consuls. In addition the American Committee for Armenian and Syrian Relief had dispatched through the State Department to various centres \$208,000 to be used in the purchase of grain, blankets, and clothing. The Christmas ship carried 600,000 pounds of rice, 200,000 pounds of lima beans, 400,000 pounds crushed wheat, 2,100,000 pounds of whole wheat, 500,000 pounds of sugar, 1000 cases of condensed milk, 10,000 barrels of flour, 50,000 gallons petroleum, and 25,000 gallons cotton-seed oil, besides immense quantities of underwear, sweaters, shoes, stockings, socks, blankets, and unbleached muslin.

**OTHER FUNDS.** Among the organizations operating in the United States, their addresses and the approximate amount of their contributions in 1916 may be mentioned the following: The Lafayette Fund, the Vanderbilt Hotel, New York, provided kits for French soldiers; it had collected by the close of 1916 about \$165,000. The Secours National Fund for the Relief of Women and Children of France, 16 East 47th Street, New York City, \$237,000. The Secours Duryea, 19 East 37th Street, New York City, maintained a relief depot at 11 Rue Louis le Grand, Paris. The fund for the American Ambulance in Russia had received \$76,800 by means of which 20 ambulance units were being maintained with the Russian armies; William H. Hamilton, 665 St. Mark's Avenue, Brooklyn, was treasurer. The Relief Fund for French Civilian Prisoners in Germany, with headquarters in New York City, received substantial donations for its purposes. The British War Relief Association, Incorporated, with Dr. Louis L. Seaman, president, and Henry Clews, treasurer, maintained headquarters at 542 Fifth Avenue.

It organized the Fund for Rumanian War Relief, aided hospitals and other relief work in Great Britain, and sent comfort kits to British soldiers. The Dollar Christmas Fund for Destitute Belgian Children cabled more than \$100,000 to help in feeding sick and destitute children in the winter of 1916-17. It made a special appeal for a minimum Christmas donation of \$100,000. The British-American War Relief Fund, Mrs. Frederick W. Whitridge, acting president, received contributions at 681 Fifth Avenue. The Russian-American Relief Association, the Flatiron Building, Mme. Bakhmeteff, wife of the Russian ambassador to the United States, honorary president, had received \$35,000 up to the middle of December. The American Committee for Training in Suitable Trades the Maimed Soldiers of France, the Biltmore Hotel, New York, had collected about \$180,000 in 1916, which sum was to be used in establishing and maintaining trade schools and two model agricultural training schools for maimed French soldiers. A Fund for the Fatherless Children of France, 111 Broadway, New York City, had collected about \$120,000. The Cardinal Mercier Fund, organized to secure means for the relief work of Cardinal Mercier in Belgium, received subscriptions through J. P. Morgan and Company, 23 Wall Street. The Polish Victims' Relief Fund, 33 West 42d Street, had collected about \$560,000 by the close of 1916. This was sent to a committee in Switzerland headed by Henryk Sienkiewicz and thence distributed to Poland. It was not a tithe of the amount needed. The Polish University Grants Committee of this fund received donations for destitute professors and scientists, scholars, and students who had taken refuge in France and Switzerland. The Committee of Mercy, the Committee for the Relief of Belgian Prisoners in Germany, the National Allied Relief Committee, and the French Heroes' Fund had offices at 200 Fifth Avenue, as did also the Charities of the Queen of Belgium Fund, and the Central Committee for the Relief of Lithuanian War Sufferers. The American Girls' Aid, 293 Fifth Avenue, had collected over \$43,000. The American Aid for Homeless Belgian Children, a fund sanctioned by King Albert, Cardinal Gibbons, and others, received generous support from contributions sent to the National City Bank. The National Surgical Dressings Committee, Mrs. Mary H. Willard, international chairman, was located at 299 Fifth Avenue. The American Branch of the Prince of Wales National Relief Fund had received \$182,000 through R. M. S. Wortley, 25 Broad Street. Gifts for the Noel du Soldat Belge were received by Paul Dumont, 10 Bridge Street. The Vacation War Relief Committee, Miss Anne Morgan, chairman, made in December an appeal for wooden boxes in which to ship clothing and personal kits for soldiers in the French hospitals. It had collected over \$325,000. Mrs. Gertrude Atherton was president of Le Bienêtre du Blessé, John Munroe and Company, treasurer, 30 Pine Street; it had collected \$3705. The War Babies' Cradle, 42 Broadway, collected funds to provide bed, food, and 10 days' care during confinement for destitute French women whose husbands were in the army. The American Comfort Packet Committee, 66 West 39th Street, had sent more than 9000 packets to the war front. In addition to the several funds above noted for the relief of French children,

the American Society for the Relief of the French War Orphans, 120 Broadway, sent an appeal to all parts of the United States and Canada in behalf of 200,000 destitute children in France. In December it reported contributions sufficient to support 5000 children during the winter. The American Authors' Fund for the Relief of Wounded Soldiers of the Allied Nations, 33 State Street, Boston, was organized by William Dean Howells, president, A. Lawrence Lowell, and other men and women of letters. The Federal Council of Churches of Christ in America sent nearly \$100,000 for the relief of French churches of Union Nationale des Eglises Réformées Evangeliques de France. Still other funds included that raised by the Committee on Destitute Children of Flanders, 21 East 11th Street; the American Girls' Aid, 203 Fifth Avenue, which had collected more than \$45,000 and sent over 6200 cases of clothing and supplies to French war sufferers; the American Aid for Homeless Belgian Children, National City Bank, treasurer; the Blue Cross Fund, which sought means for the care of wounded horses, 55 East 93rd Street.

See RED CROSS; ROCKEFELLER PHILANTHROPIC BOARDS.

**RELIGION, BOOKS ON.** See LITERATURE, ENGLISH AND AMERICAN.

**RELIGIOUS DENOMINATIONS AND MOVEMENTS.** Statistics of the religious denominations of the United States in 1916 were prepared by the religious statistician, Rev. Dr. H. K. Carroll, associate secretary of the Federal Council of the Churches of Christ in America. The results are given in the accompanying table. The statistics cover only the territory of the United States, the ministers, churches, and communicants of the various denominations in foreign countries being deducted from the denominational totals. The preference has been given to official returns where it has been possible to obtain them, and where such returns have not been obtainable, the best denominational sources of information have been consulted for approximate figures. It is chiefly the very small religious bodies that report no official returns, or imperfect returns. In a few instances the denominational officials, usually statisticians, have given an estimate of the annual increase, when the official reports had not been completed. The tables are arranged alphabetically and the basis of classification is name or historical relation. The few non-Christian bodies are easily separable from the Christian.

The true meaning of the returns will not be clear until the reader understands the various principles of classification on which they are based. For example, the membership returns of the great Methodist, Baptist, Lutheran, and Presbyterian denominations do not afford an adequate idea of the population represented by them. Moderate estimates of Methodist statisticians place the denominational population at two and a half times the membership, which would amount in 1916 to over 19,000,000. The Methodist population would rarely be placed lower than 16,000,000 or 17,000,000 even by conservative estimates. A similar method should be followed in estimating the population of the other great Protestant denominations.

The Roman Catholic Church reports only "population," which includes with communicants the unconfirmed baptized, that is, children

who have not been admitted to confirmation. According to the rate of the census of 1890 and also that of 1906 there was a deduction of 15 per cent from the Catholic population and the remaining 85 per cent was set down as communicants. To objections made against this method the obvious reply is that the rule to report only members or communicants applies to all denominations, and that there is no convenient way of making an exception to the Roman Catholic returns.

The Jewish statistics in this table are misleading, since there are no public returns made by that denomination and nothing later than the figures gathered directly by circular from congregations by the government in 1906 is available. The census gives an even smaller number of members than this table, counting only heads of families, according to the Jewish rule. See JEWS AND JUDAISM.

No official returns are made by certain small churches, including the Christian Catholic Church (Dowie) and the Catholic Apostolic Church. No official returns of membership have been given by the Church of Christ Scientist since 1907.

Changes in the totals for 1916 have been made because in some cases the denominational returns were not correct and were revised later by those who first made them. In other cases advance estimates given before regular returns came in needed to be slightly increased or decreased.

Dr. Carroll's figures show that the churches of the United States have not suffered financially from the European war and the increased cost of living, nor has their usual rate of growth declined. Millions of dollars have been freely sent by them to the war-afflicted populations of Europe and Asia, and yet they have gone on with their regular work, evangelistic, missionary, benevolent, and educational, with undiminished force. In 1916 the Protestant, Catholic, and Eastern Orthodox Churches had an aggregate of more than 40,000,000 communi-

cants or members, going beyond the 40,000,000 mark by nearly 2000. The net increase of the year was 732,000, or 189,000 more than the increase for 1915. In 1890 the total religious strength was 20,618,000, so that in the 26 years following the net increase has been 19,383,000, or 94 per cent, while the gain in the population of the country for the same period has been about 39,000,000, or 61 per cent. The religious denominations have therefore gained faster than the population. Of the gains in 1916, about 216,000 were of the Roman Catholic and about 500,000 of the Protestant bodies. Among the latter, a gain of 136,000 is recorded by the Methodist, 132,000 by the Baptist, and more than 79,000 by the Presbyterian and Reformed. The Disciples of Christ had a gain of 44,000, the Episcopal Church of 27,000, and the Lutherans of 20,000.

In 1916 there was a gain over 1915 of only 109 in the number of churches; but in 1915 there was a net loss. The small increase in 1916 is due to decreases reported by several denominations and denominational groups. An apparent loss of 769 by the Disciples of Christ is caused by the defective counting of previous years. The Methodist Episcopal Church lost 68, the Northern Baptists 33, the Northern Presbyterians 97, the Episcopalians 7. These and other losses reduce the considerable gains of the Roman Catholics, 199, the United Brethren, 70, the Lutheran Synodical Conference, 105, etc. Rural churches were evidently closed or merged for economical reasons.

The gain in ministers is 2618, nearly double that of 1915. The largest gain is 478, reported by the Roman Catholic Church; the Baptists gained 365, the Lutherans 159, and other denominations made smaller gains.

Statistics for Sunday schools in the United States for 1916 show a much larger aggregate of Sunday school scholars than in any previous report, and that the net increase in 1906-16 was more than 6,300,000, with a gain of between 15,000 and 16,000 schools.

Summary for 1916

Net Gains for 1916

Denominations	Ministers	Churches	Communicants	Ministers	Churches	Communi- cants
Adventists (6 bodies) . . . . .	1,501	2,794	112,054	268	52	5,707
Baptists (15 bodies) . . . . .	48,911	57,784	6,584,132	365	101	181,879
Brethren (Dunkard) (4 bodies) . . . . .	3,645	1,295	128,594	91	35	4,750
Brethren (Plymouth) (4 bodies) . . . . .	408	408	10,566	..	..	..
Brethren (River) (3 bodies) . . . . .	224	105	4,903	..	..	..
Buddhists (2 bodies) . . . . .	15	74	3,165	..	..	..
Catholic Apostolic (2 bodies) . . . . .	83	24	4,927	..	..	..
Catholic (Eastern Orthodox) (7 bodies) . . . . .	404	475	485,500	66	56	18,000
Catholic (Western) (3 bodies) . . . . .	20,129	15,447	14,380,370	492	219	220,782
Christadelphians . . . . .	..	70	1,500	..	..	..
Christians . . . . .	1,066	1,360	106,159	d 90	25	d 2,329
Christian Catholic (Dowie) . . . . .	35	17	5,865	..	..	..
Christian Union . . . . .	865	330	16,825	5	10	525
Church of Christ Scientist . . . . .	2,998	1,499	85,096	170	85	..
Churches of God (Winebrennerian) . . . . .	434	484	28,033	d 6	d 9	d 617
Churches of the Living God (Colored) (3 bodies) . . . . .	101	68	4,286	..	..	..
Churches of the New Jerusalem (2 bodies) . . . . .	140	150	9,772	d 7	d 1	59
Church Transcendent . . . . .	2	3	148	..	..	4
Communitistic Societies (2 bodies) . . . . .	..	13	1,989	..	d 9	d 283
Congregationalists . . . . .	5,974	6,106	790,488	d 23	3	10,074
Disciples of Christ (2 bodies) . . . . .	8,424	11,182	1,387,450	386	d 769	44,053
Evangelical (2 bodies) . . . . .	1,572	2,573	209,917	8	d 28	4,662
Faith Associations (9 bodies) . . . . .	241	146	9,572	..	..	..
Free Christian Zion Church . . . . .	20	15	1,885	..	..	..
Friends (4 bodies) . . . . .	1,379	964	119,371	d 92	d 34	d 766
Friends of the Temple . . . . .	3	3	376	..	..	..
German Evangelical Protestant . . . . .	59	66	34,704	..	..	..
German Evangelical Synod . . . . .	1,089	1,389	274,787	4	11	10,690
Jewish Congregations . . . . .	1,084	1,769	143,000	..	..	..
Latter-Day Saints (2 bodies) . . . . .	4,285	1,705	409,000	100	25	3,000
Lutherans (21 bodies) . . . . .	9,347	15,289	2,454,334	159	20	20,150
Scandinavian Evangelical (3 bodies) . . . . .	663	577	62,900	34	d 80	..

Summary for 1916

Net Gains for 1916

Denominations	Ministers	Churches	Communicants	Ministers	Churches	Communi- cants
Mennonites (12 bodies) .....	1,488	818	64,796	12	53	8,465
Methodists (16 bodies) .....	41,800	62,783	7,608,284	62	55	136,176
Moravians (2 bodies) .....	148	147	21,859	d 1	...	718
Non-sectarian Bible Faith Churches .....	50	204	6,896	...	...	...
Pentecostal (2 bodies) .....	1,011	1,018	36,119	121	135	2,710
Presbyterians (12 bodies) .....	13,885	16,298	2,171,601	43	d 86	67,562
Protestant Episcopal (2 bodies) .....	5,680	8,134	1,078,435	59	d 7	26,739
Reformed (4 bodies) .....	2,223	2,808	514,543	68	26	11,941
Reformed Catholic .....	7	6	3,250	...	...	...
Salvation Army .....	3,225	967	28,208	264	26	539
Schwenkfelders .....	6	6	1,072	...	...	29
Social Brethren .....	15	17	1,262	...	...	...
Society for Ethical Culture .....	7	6	2,450	...	...	...
Spiritualists .....	...	1,500	200,000	...	...	...
Theosophical Society .....	...	174	5,861	...	20	1,147
Unitarians .....	504	472	71,110	d 8	3	568
United Brethren (2 bodies) .....	2,247	4,092	366,877	62	70	6,490
Universalists .....	662	865	58,800	6	102	3,300
Independent Congregations .....	267	879	48,673	...	...	...
Grand total in 1916 .....	182,818	225,313	40,001,709	2,618	109	731,669
Grand total in 1915 .....	180,200	225,204	39,270,040	1,312	d 289	542,962

d Decrease.

**RELIGIOUS PHILOSOPHY.** See PHIL-  
OSOPHY.

**REMEDIAL LOANS.** See LOAN SHARKS.

**BENSSELAER POLYTECHNIC INSTI-  
TUTE.** A non-sectarian institution for the  
technical education of men at Troy, N. Y. It  
was founded in 1824. In the several depart-  
ments there were 665 students enrolled in the  
fall of 1916 and the faculty numbered 63. Dur-  
ing the year Lewis F. Moody, professor of hy-  
draulic engineering on the Russell Sage Founda-  
tion, resigned and R. L. Daugherty was ap-  
pointed to succeed him. A dining-hall was pre-  
sented by Mrs. Russell Sage, dormitories by Al-  
fred T. White and Capt. Robert W. Hunt, and a  
wireless telegraph installation by W. A., C. G.,  
and G. A. Roebling. I. C. Blandy, '87, gave \$8000  
to establish a scholarship. In productive funds  
the institute has \$1,550,000, from which in 1916  
it drew an income of \$69,000. The library con-  
tains 11,300 volumes. President, Palmer Cham-  
berlaine Ricketts.

**REORGANIZATIONS, RAILWAY.** See RAIL-  
WAYS.

**REORGANIZED CHURCH OF JESUS  
CHRIST OF LATTER DAY SAINTS.** This  
is a separate organization of Mormons claim-  
ing to be the true successor of the original  
church founded in 1830 by Joseph Smith. It  
was reorganized in 1852. Its chief offices are at  
Lamoni, Iowa. In 1916 it had 78,326 members,  
about 1200 ministers, 38,938 Sunday school pu-  
pils, and 746 Sunday schools. Its officers are:  
Benjamin R. McGuire, presiding bishop; Rich-  
ard S. Salyards, general church secretary.

**RESEARCH COUNCIL, NATIONAL.** See  
ACADEMY OF SCIENCES, NATIONAL.

**RESERVE CORPS.** See MILITARY PROG-  
RESS.

**RESERVOIRS.** See AQUEDUCT; DAMS;  
FLOODS; IRRIGATION.

**RESIDENCES.** See ARCHITECTURE.

**RESUSCITATION.** Prof. Yandell Hender-  
son, of Yale University, who has acted as con-  
sulting physician to the United States Bureau  
of Mines, attempts to estimate the value of the  
various forms of resuscitation apparatus which,  
in increasing numbers, are being exploited in  
response to the "safety first" movement. Hos-  
pitals, gas works, electric light and telephone  
companies, city police and fire departments,

etc., are constantly applying for information as  
to the relative value of the work done by such  
instruments. The first instrument to attract  
attention was the pulmotor. This is a device  
comprising a tank of compressed oxygen, con-  
necting, through a reducing valve, with an in-  
jector, so that a considerable volume of air is  
drawn in through a hose attached to a face  
mask. Contrary to the general belief that pure  
oxygen, or air greatly enriched by oxygen, was  
thus furnished, analyses showed that the oxy-  
gen content of the mixture supplied was about  
28 to 30 per cent; and as pure air contains 21  
per cent of oxygen, the amount of enrichment  
therefore was not considerable. The force of  
the air coming from the injector is actuated by  
an ingenious mechanical device, by which a  
valve is alternately thrown in one direction or  
the other, so that the air is blown into or sucked  
from the mask fastened over the patient's face.  
In order for this device to reverse, however, a  
considerable positive or negative pressure is  
necessary, and these pressures come just at  
those points in respiration at which they are  
most unnatural. Furthermore, in case of any  
obstruction to the flow of air, the positive and  
negative pressures necessary to reverse the ap-  
paratus are induced in such rapid succession  
that the suction and injection phases alternate  
too rapidly for the subject's lungs to be prop-  
erly distended and deflated. This is liable to  
occur if for any reason there is an obstruction  
in the throat. Some parts of the injector or  
reducing valve are also found liable to get  
out of order, thereby rendering the apparatus  
ineffective.

The objection to the pulmotor concerned not  
only its deficiencies as a means of adminis-  
tering artificial respiration, but also its extra-  
ordinary effect on public opinion. A later model  
of the pulmotor has been made (model B), the  
mechanism of which is rather delicate and eas-  
ily put out of order and is similar to the ori-  
ginal model excepting that the automatic feature  
is eliminated.

The lungmotor consists of two pumps, fast-  
ened together in such a way that the down  
stroke forces air from one pump into a mask  
fitted over the patient's face, while the up  
stroke withdraws air from the lungs into the  
other pump. An oxygen tank may be connected

with the apparatus so that the air injected can be enriched with oxygen to any desired degree.

The vivator is a still simpler instrument, consisting of one pump, which forces air through a tube to the mask with the down stroke of the plunger and of a valve which opens to allow the air to escape during the up stroke. With both vivator and lungmotor it is possible that a somewhat excessive positive pressure may be made, and Henderson advises that in such apparatus there should be a blow-off valve or some similar device set to open under a water column pressure of 10 inches; and when there is also a suction pump, there should be an inlet valve set to open under pressure of six inches. Henderson comes to the conclusion that: (1) Universal training in the prone pressure manual method of artificial respiration will accomplish more for resuscitation from drowning, electric shock, and asphyxia than is possible by providing any amount of apparatus. (2) Artificial respiration with apparatus is superior to the manual method, in that the apparatus is capable of giving a normal volume of pulmonary ventilation, while the manual method is not. (3) Nevertheless, the immediate application of a poor method is far more important than the application of a perfect method after a delay of even five minutes. The knowledge that apparatus is available is liable to result in a neglect of immediate manual treatment in order to have the apparatus brought from a distance. (4) Apparatus should be provided only in places in which it will be immediately available. (5) Since artificial respiration with air more or less enriched with oxygen is all that any apparatus yet invented affords, it should be of a simple type so as not to produce exaggerated ideas of its efficiency. (6) Oxygen inhalation should be used immediately in gas and smoke cases, but the apparatus employed should be such as to allow the oxygen to reach the patient's lungs in efficient concentration. Such apparatus should go with every artificial respiration device. (7) Investigation of the use of artificial respiration apparatus in *asphyxia neonatorum* is needed.

**RÉUNION, or BOUBON.** A French colony; an island in the Indian Ocean, covering 1980 square kilometers (764 square miles), and having (1911) 173,822 inhabitants. Saint Paul (7 square kilometers), New Amsterdam (66), and Kerguelen (3414) are administratively attached to Réunion. Saint-Denis (26,689 inhabitants) is the capital.

**REVENUE, GOVERNMENT.** See articles on various countries and on States of the United States; also FINANCIAL REVIEW.

**RHINE-ELBE CANAL.** See CANALS.

**RHODE ISLAND. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 620,090. The population in 1910 was 542,610.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn ..... 1916	11,000	341,000	\$471,000
..... 1915	12,000	516,000	516,000
Oats ..... 1916	2,000	54,000	37,000
..... 1915	2,000	66,000	33,000

	Acreage	Prod. Bu.	Value
Potatoes .... 1916	5,000	370,000	684,000
..... 1915	5,000	550,000	508,000
Hay ..... 1916	60,000	81,000	1,620,000
..... 1915	57,000	71,000	1,598,000

a Tons.

See AGRICULTURAL LEGISLATION.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments ..	1,951	2,190
Average number of wage earners .....	118,538	113,425
Capital invested .....	\$290,901,000	\$308,445,000
Wages .....	55,234,000	59,366,000
The value of materials used .....	158,192,000	162,425,000
The value of products .....	280,344,000	279,546,000

**TRANSPORTATION.** The total mileage of main track in the State in 1916 was 1972, practically all of which was operated by the New York, New Haven, and Hartford or its subsidiary companies.

**EDUCATION.** The total school population of the State in 1916 was 129,985. The total enrollment was 87,064. The average daily attendance was 76,337. The teachers, male and female, numbered 2680. The average yearly salary of teachers is \$714.37.

**FINANCE.** The report of the Treasurer for the fiscal year ending Dec. 31, 1916, shows receipts amounting to \$3,815,477, and payments amounting to \$3,782,639. There was a balance on Dec. 31, 1916, of \$31,390.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include the State Hospital for the Insane, House of Correction, State Alms House, the State Prison, State Providence County Jail, Sockanosset School for Boys, and the Oaklawn School for Girls. The Rhode Island State School for the Feeble-Minded is under the State Board of Education.

**POLITICS AND GOVERNMENT.** An unusually lively campaign was experienced in Rhode Island where, for the first time, a United States Senator was elected by the direct vote of the people. The presidential and senatorial elections, together with the election of a complete list of State officials, including a legislature of 139 members, and municipal elections in nearly all of the 39 cities and towns in the State, combined to create a most acute interest in every section.

The official vote cast for the leading candidates in the State for congressional and State offices follow: President: Hughes, 44,858; Wilson, 40,394; Benson, 1914; plurality for Hughes, 4464. United States Senator: Peter G. Gerry, Dem., 47,048; Senator Henry F. Lippitt, Rep., 39,211; Fred Hurst, Soc., 1996; plurality for Gerry, 7837. Governor: R. Livingston Beekman, Rep., 49,524; Addison P. Munroe, Dem., 38,158; John Holloway, Soc., 2167; plurality for Beekman, 13,366. Congress: First District, Congressman George F. O'Shaunessy, Dem., defeated Ezra Dixon, Rep.; Second District, Congressman Walter R. Stines, Rep., defeated Sumner Mowry, Dem.; Third District, Congressman Ambrose Kennedy, Rep.,

defeated Joseph McDonald, Dem. The Republicans retained control of the General Assembly, but the margin was considerably decreased, especially in the State Senate.

Officially the political campaign did not get under way until the middle of September, but the Republican slate had been known for many weeks with the exception of the nominee for Congress in the first district. Ezra Dixon of Bristol defeated Guy Norman of Newport for the nomination at the convention. The first of the series of caucuses, three being required by each party to complete the State and municipal delegations, was held on September 19th. Then followed the series of conventions, four for each of the major parties. A State convention nominated presidential electors, United States senator, Governor, and other general State officers. There was also held one convention for each of the three congressional districts. The first State convention was the Socialist, on September 28th. Then came the Democratic on October 5th, and the Republican on October 11th. A brief synopsis of the major parties' State platforms follows:

**Republican.** Endorsed national platform, declared for adequate military preparedness, and condemned Democratic handling of preparedness situation; condemned interference in Mexico, with record of "incompetence, timidity, and vacillation" on the part of the President; declared for a protective tariff; endorsed Hughes, Lippitt, and Beeckman; condemned Democratic extravagance; favored woman suffrage "but recognizes the right of each State to settle this question for itself."

**Democratic.** Endorsed national platform and Democratic preparedness moves; endorsed Wilson for "honorable peace" and for averting railroad strike; endorsed Federal reserve and rural credits legislation; condemned practice of "bribery" in Rhode Island elections, and "mismanagement" of State finances; demanded several constitutional amendments, and asked for test vote referendum on the woman suffrage question.

Both parties brought in speakers of national reputation. Mr. Hughes was in the State before nomination, and afterward; Vice-President Marshall delivered a political address. The Republicans held a torchlight procession and the Democrats an automobile illuminated cavalcade. Noonday rallies were held at mill gates during lunch hours by both parties. A large quantity of literature was sent out by mail, but only a small portion went on congressional franks. Extensive advertising campaigns were conducted in the newspapers by both parties, and on election day the customary efforts to "get out the vote" were used. The vote was heavy and the number of ballots cast to the number eligible to vote was unusually high. The very great proportion of "split" tickets cast in 1916 is indicated by the figures, which give a Republican Governor 13,366 plurality and a Democratic United States senator 7837 plurality, each elected on a State-wide campaign by the same electorate.

**LEGISLATION.** The Legislature met in 1916, and passed many measures of importance. A record of these is given below:

The organization of cooperative agricultural associations was authorized. A measure was passed for finding a legal bushel for foreign

products. New laws were passed relating to the regulation of motor vehicles. The laws relating to taxation were amended, as were also the laws relating to health and sanitation. The laws relating to banks and banking received important amendments.

**STATE OFFICERS.** Governor, R. Livingston Beeckman; Lieutenant-Governor, Emery J. San Souci; Secretary of State, J. Frederick Parker; Attorney-General, Herbert A. Rice; Treasurer, Walter A. Read; Adjutant-General, Charles W. Abbott, Jr.; Auditor, Charles C. Gray; Commissioner of Public Schools, Walter E. Ranger; Commissioner of Insurance, State Auditor, ex-officio—all Republicans.

**JUDICIARY.** Supreme Court: Chief Justice, Clarke H. Johnson; Associate Justices, C. Frank Parkhurst, W. B. Vincent, William H. Sweetland, Darius Baker; Clerk, B. S. Blaisdell.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Republicans .....	25	66	91
Democrats .....	13	83	46
Independent .....	1	..	1
Republican majority..	11	33	44

**RHODESIA.** A British protectorate (named for Cecil Rhodes) in South Africa, administered by the British South Africa Company. It is divided into Northern and Southern Rhodesia.

**NORTHERN RHODESIA** consists of the two former provinces of Barotseland (Northwestern Rhodesia) and Northeastern Rhodesia, and was constituted a single British sphere in 1911. Its area is estimated at 291 square miles and its native population (1911) at 821,102. The administrator resides at Livingstone. Other towns are Fort Jameson, Broken Hill, and Lealui (the province of the native king, Lewanika, chief of the Barotse).

**SOUTHERN RHODESIA** contains Mashonaland and Matabeleland: total area, 148,575 square miles. A census taken May 7, 1911, showed a total of 23,606 Europeans; 12,631 in Mashonaland, 10,975 in Matabeleland. Native population, 744,559 (495,451 and 249,108). Salisbury, the capital, had 3479 white inhabitants; Bulawayo (5200 whites) is the commercial centre.

**PRODUCTION.** Large tracts have been brought under cultivation (cereals, vegetables, tobacco, fruits, etc.), and the country is admirably adapted to the raising of stock of all kinds.

The following table gives trade statistics for calendar, and financial statistics for fiscal, years:

	1908-9	1910-11	1911-12	1914-15
Imps. ..	£1,818,372	£2,786,321	£2,975,112	£2,768,584
Exps. ..	2,718,476	3,018,099	3,098,400	2,958,055
Rev. ...	564,399	784,908	817,354	825,500
Expend. .	535,150	684,688	737,578	895,634

**RHONDDA, BARON.** See GREAT BRITAIN, Government.

**RHUS POISONING.** Some new light has been thrown on the nature of this subtle poisoning and the method by which it spreads. The plants commonly implicated are *Rhus diversiloba T. and G.*, or poison oak; *Rhus toxicodendron L.* (poison ivy), and *Rhus vernio L.*, Japanese poisonous sumac. Largely due to the studies of McNair of the University of California, it is now definitely proved that the toxic substance is a nonvolatile resin which

does not reside in the pollen or plant hairs, and that the part of the plant to be feared is the resinous sap. The sticky exudation flowing from an injured plant may come in contact with the hands or other exposed parts of the body, or may be carried indirectly on clothing or tools, or by insects, smoke, etc., some distance from the neighborhood of its origin. The irritant resin, having once come in contact with the skin, is diffused slowly through the sweat glands, hair follicles, and even through the skin itself, where this is thin.

McNair does not believe that sufficient poison can be carried by an insect to give rise to a severe case of rhus poisoning, but mild cases may thus arise. He also calls attention to the great increase in white corpuscles during severe attacks (sometimes more than 12,000 leucocytes to a cubic millimeter) accompanying the constitutional reaction, with fever, coated tongue, and faint albuminuria.

**RIBOT, ALEXANDER.** See FRANCE, *History*.

**RIBOT, THÉODORE ARMAND.** A French psychologist, died Dec. 9, 1916. He was born at Guingamp, Dec. 18, 1839, and was educated at the Lycée de Saint-Brieure and at the Ecole Normale, Paris, where he received a doctor's degree in 1875. After filling the chair of philosophy at various lycées for several years he went to Paris and studied psychology on the physiological and experimental side, using for that purpose the histological and physiological laboratories, and the clinics of the insane asylums. In 1876 he founded the *Revue Philosophique*, of which he became the editor. In 1885 he gave a course of lectures in experimental psychology at the Sorbonne and in 1888 was appointed professor of experimental and comparative psychology in the Collège de France. Ribot was a leader in the development of psychology in France, selecting what was best in both English and German methods and results, while at the same time his work was characteristically French in breadth of view. Of special importance are his psychopathological studies and the analytical and comparative treatment of distinctive types or fields of mental phenomena in his later books. Many editions of his works have been published, and the most important of the latter have been translated into English. His writings include: *La psychologie anglaise contemporaine* (1870); *L'Hérédité psychologique* (1873); *Philosophie de Schopenhauer* (1874); *Psychologie allemande contemporaine* (1879); *Les maladies de la mémoire* (1881); *Les maladies de la volonté* (1883); *Les maladies de la personnalité* (1885); *La psychologie de l'attention* (1889); *Psychologie des sentiments* (1896); *L'Évolution des idées générales* (1897); *Essai sur l'imagination créatrice* (1900); *Essai sur les passions* (1906; 3rd ed., 1910); *Problèmes de psychologie affective* (1910); *La vie inconsciente et les mouvements* (1913).

**RICE.** Most of the principal rice producing countries in 1916 reported normal or good yields. The crop of India for 1915-16 was the highest on record as to both area and production, the yield being estimated at 32,877,000 tons, as against 27,242,000 tons the preceding year, or an increase of 21 per cent. In the United States the acreage, yield per acre, total production, and total value of crop exceeded those recorded for any previous year. Italy

and Egypt reported good yields, but in Egypt the acreage was much reduced as compared with previous years. The production of the United States was exceptionally large, amounting, as estimated by the Department of Agriculture, to 41,982,000 bushels on 878,800 acres, the average yield being 47.8 bushels per acre. All these figures constitute records. In 1915 the production was 28,947,000 bushels, the area 802,600 acres, and the average yield 36.1 bushels per acre. The average farm value on Dec. 1, 1916, was 88.6 cents per bushel and the total value of the crop on this basis \$37,186,000, a value never before reached. Rice was the only cereal with the bushel value lower on Dec. 1, 1916, than on Dec. 1, 1915, when its farm value was 90.6 cents. The leading States and their yields were as follows: Louisiana, 20,392,000 bushels; Texas, 10,575,000 bushels; Arkansas, 6,312,000 bushels; and California 4,543,000 bushels. The areas devoted to the crop in these States were respectively, 443,300, 235,000, 125,000, and 67,800 acres. South Carolina produced 49,000 bushels on 3500 acres. The other rice producing States were North Carolina, Georgia, Florida, Missouri, Alabama, and Mississippi. California practically doubled its acreage as compared with the preceding year.

**RICE, CALE YOUNG.** See LITERATURE, ENGLISH AND AMERICAN, *Poetry*, American.

**RICHARDS, THEODORE WILLIAM.** See ADVANCEMENT OF SCIENCE, AMERICAN ASSOCIATION FOR THE; CHEMISTRY, GENERAL.

**RICHTER, HANS.** An Austrian music conductor, died at Bayreuth Dec. 7, 1916. He was born in April, 1843, at Raab, Hungary, where his father was Kapellmeister. In 1853 he began his musical studies at the Vienna Conservatory, and in 1868, through the influence of Richard Wagner, he was appointed chorus master at the Munich Opera. In 1870 he conducted *Lohengrin* at Brussels, and in 1871-75 was Kapellmeister at the Budapest National Theatre. For several seasons he conducted the concerts of the Vienna Gesellschaft der Musikfreunde, and in 1876 conducted the Nibelungen performances at Bayreuth. He began the celebrated annual Richter concerts in London in 1877. In 1897 he settled in Manchester as conductor of the Symphony Orchestra, also conducting the Wagner performances at Covent Garden, London. In 1911 he returned to Vienna and retired through ill health. He was the most prominent Wagnerian conductor in Europe. Oxford gave him an honorary degree.

**RIDGE, W. PETT.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, English.

**RIGHT OF SEARCH.** See CONTRABAND OF WAR.

**RILEY, JAMES WHITCOMB.** An American poet, died at Indianapolis, Ind., July 22, 1916. He was identified all his life with Indiana, his native State, and in a peculiar way. Known as the "Hoosier poet," he was one of that group of writers in prose and verse, including besides himself Edward Eggleston, Meredith Nicholson, George Ade, and Booth Tarkington, who have made a name for Indiana as the literary centre of the Middle West. Even when, as for some time, he was resident in Chicago, contributing to the papers, his writing was largely in the dialect or vernacular with which he was familiar—that of the Indiana countryside. Like Eugene Field, whom he came to know in Chi-



cago, where both were members of the "Saints' and Sinners' Corner," an informal literary club, he will be best remembered for the homely, kindly verse that he wrote about children. It is said that in later life he rather depreciated his "dialect" poetry and wished to be remembered by more pretentious efforts, but he had found his place in the other field.

James Whitcomb Riley was born Oct. 7, 1853, at Greenfield, Ind. His father, a lawyer, wished him to follow the same profession, but he was averse to any calling that left so little personal freedom. His early ways of supporting himself were oddly varied. For a time he was a sign painter; then he identified himself with a company of players; he wrote jingling verse to advertise the wares of a patent medicine vendor, whom he accompanied on rural travels; he helped form a band of amateur musicians who traveled about playing, and incidentally painting advertisements; and he wrote rhymes for an Anderson paper on the products of that town. As a young man Riley gained wide notoriety in a way that he later regretted. To play a practical joke on a rival paper that had ridiculed his verse he wrote a clever imitation of a Poe poem and passed it off as genuine, a recent "find," under the title "Leonainie." Finally, of course, and with chagrin, he had to admit the hoax. It was under the pen-name of "Benj. F. Johnson, of Boone," that his early newspaper contributions appeared, as well as his first book, *The Old Swimmin' Hole and 'Leven More Poems* (1883). Much of his work appeared from time to time in the *Indianapolis Journal*. It gave him a reputation which gradually spread, attracting the notice of Longfellow and then of other literary men, till the time came when he was showered with honors. He was elected to the American Academy of Arts and Letters, received the gold medal of the National Institute of Arts and Letters, accepted honorary degrees from Yale, Wabash College, Indiana University, and the University of Pennsylvania, and in 1915 saw his birthday made a day of celebration throughout Indiana.

After his death his body lay in state in the capitol at Indianapolis. For many years Mr. Riley had made his home in this city, on the Lockerbie Street celebrated in his verse. He was unmarried. A biographical edition of his works in six volumes was published in 1913. Among the more familiar of his poems, the titles of which were often taken as the titles of collected verse, are: "The Old Swimmin' Hole," "An Old Sweetheart of Mine," "Orphant Annie," "The Raggedy Man," "Out to Old Aunt Mary's," "When the Frost is on the Punkin," and "Knee Deep in June." Consult Clara E. Laughlin, *Reminiscences of James Whitcomb Riley* (New York, 1916).

**RILEY, JOHN B.** See PENOLOGY.

**RINEHART, MARY ROBERTS.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction and Travel, American*.

**RITTMAN PROCESS.** See CHEMISTRY, INDUSTRIAL.

**ROADS AND PAVEMENTS.** Vast sums continued to be provided for the surfacing of city streets and country roads to meet the increasing demands of traffic, particularly the wear and tear of motor vehicles of all sorts. No new street or road material established itself during the year. Granite block, asphalt, brick,

wood block, concrete with Portland cement and with bituminous binder, macadam, both water-bound and bituminous, but chiefly the latter, continued to be the main standby, with many variations in details. Heavier traffic needs and demands for better streets and roads are leading everywhere to a call for heavier, more durable, smoother, and more cleanly road and street surfaces.

Under a Federal-Aid Road Bill enacted by Congress, \$5,000,000 was made available for allotment to the several States for the year ending June 30, 1917, and thereafter increases of \$5,000,000 yearly until the sum of \$25,000,000 for 1921 is reached. The money was to be apportioned in thirds among the States in the ratios of their respective populations, areas, and mileages of rural mail delivery and star routes to the area, population, and mileage of the whole country. The grants were to be dependent upon the appropriation of like sums and the fulfillment of other conditions by the States, and the money was to be expended under the supervision of the United States Office of Public Roads and Rural Engineering. The 1916-17 allotments after deducting 3 per cent for Federal supervision are shown by the accompanying table. The bill also appropriated \$1,000,000 a year "for the survey, construction, and maintenance of roads and trails within or partly within the national forests."

FEDERAL ROAD ALLOTMENTS, 1916-17  
(In thousands of dollars)

Alabama	104	Nevada	64
Arizona	64	New Hampshire	21
Arkansas	88	New Jersey	59
California	151	New Mexico	79
Colorado	84	New York	251
Connecticut	81	North Carolina	114
Delaware	8	North Dakota	76
Florida	56	Ohio	187
Georgia	184	Oklahoma	115
Idaho	60	Oregon	79
Illinois	221	Pennsylvania	231
Indiana	186	Rhode Island	12
Iowa	146	South Carolina	72
Kansas	148	South Dakota	81
Kentucky	97	Tennessee	114
Louisiana	67	Texas	292
Maine	48	Utah	57
Maryland	44	Vermont	23
Massachusetts	74	Virginia	100
Michigan	146	Washington	72
Minnesota	142	West Virginia	58
Mississippi	89	Wisconsin	128
Missouri	170	Wyoming	61
Montana	98		
Nebraska	107	Total	4,850

STATE ROAD WORK continued unabated. California, to name only one example, voted \$15,000,000 additional bonds for highway improvements. The total vote and the majority were each much larger than for the \$18,000,000 road bond issue authorized a few years ago. County Road Bond issues ranging from a few hundred thousand to millions of dollars were on the increase. After a successful bond campaign, Vermillion County, Illinois (Danville is the county seat), began to build 170 miles of improved roads in 1916. The work was carefully planned for rapid execution in two working seasons. Competition for the contracts was keen, 135 bids having been received from contractors located in all parts of the country. For one section alone, 23 separate bids were put in. The county supplies the cement for the work. There were to be 150 miles of concrete, and 20

miles of brick laid directly on a concrete foundation before the latter had set—"monolithic brick pavement." P. C. McArdle, Danville, Ill., was the supervising engineer. (See *Engineering News*, Aug. 10, 1916, for details.) In Missouri, St. Louis County was to spend a \$3,000,000 bond issue for road improvement, the validity of the bonds having been established towards the close of the year. That all road funds were not being spent under proper engineering supervision was illustrated by the fact that one western county had entrusted the direction of the work to a \$4-a-day superintendent.

**LINCOLN HIGHWAY.** Progress continued on the Lincoln Highway, a through route from New York to San Francisco, being promoted by the Lincoln Highway Association. The character of the improvements ranged from brick and concrete through various classes of macadam to the mere shaping up of dirt roads. "Seedling miles" were put down here and there to beget other miles by the force of good example. Bridges were being strengthened. In Pennsylvania an effort was being made to eliminate toll roads—this being the only State on the route that had not left toll roads behind. The bulk of the improvements were made at public expense, but manufacturers interested in the sale of road materials have contributed supplies for some of the "seedling miles."

**SCENIC HIGHWAYS** continued to be built. A notable addition was the Twin Peaks Boulevard, San Francisco, commanding a fine view of that city and its vicinity. The Pike's Peak Motor Highway, Colorado, was opened on July 22nd. It is from 20 to 50 feet wide, has a maximum grade of 12½ per cent, and a summit elevation of 14,109 feet—said to be the highest automobile roadway of its class in the world. It will be used for automobile climbing contests.

**CONCRETE** road surfaces were being extended in various parts of the United States. An eight-mile stretch of such road between Easton and Bethlehem, Pa., was opened with official flourishes on November 2nd by Governor Brumbaugh and representatives of the William Penn Highway Association and the Portland Cement Association. It was expected that the improvement would be extended from Bethlehem to Allentown in 1917. Some 150 miles of concrete roads were contracted for by Vermillion County, Ill. (mentioned elsewhere in this article). Other localities noted for concrete roadways are Wayne County, Mich., and Sioux City, Iowa. The concrete on the roadways mentioned is made with Portland cement as a binder. In various other localities asphaltic concrete had been and was being used and in some places Portland cement concrete was surfaced with asphalt.

**BRICK.** Small brick cubes for resurfacing worn macadam were laid for trial in Monroe County, N. Y. (J. Y. McClintock, County Engineer, Rochester, N. Y.). The cubes were 2¼ inches on a side and weighed about a pound each. The old macadam was brought up to the proper crown with sand. The cubes were laid out on a pallet, the latter was placed on the sand surface, and pulled from under the cubes. The cubes were then tapped with a hammer and covered lightly with sand. The cost of the resurfacing was \$12,000 a mile for a roadway 12 feet wide. The use of brick cubes followed an experiment with 2-inch concrete cubes begun a

half dozen years earlier in Monroe County. These were not wholly satisfactory, perhaps because the concrete was not strong enough.

**DAMAGE.** An extreme illustration of the damage to roads and pavements by too heavy motor vehicles was afforded on 42nd Street, New York City, where heavy granite blocks, recently laid, were crushed and their tops powdered by motor trucks loaded with stone from the excavation for the new subways. The loads were abnormal, running as high as 19 tons each, but damage of less though serious degree was occurring on city pavements and improved roads throughout the country, showing the need of firm and intelligent control of the use of highways by motor trucks. Both New York and New Jersey had drastic legislation on this subject under consideration at the close of 1916. See **AUTOMOBILES; UNITED STATES DEPARTMENT OF AGRICULTURE.**

**Bibliography.** Among the new books of the year were: T. R. Agg, *Construction of Roads and Pavements* (New York); A. H. Blanchard, *Elements of Highway Engineering* (New York); J. I. Tucker, *The American Road* (Norman, Okla.).

**ROBERTSON, AGNES** (MRS. DION BOUCICAULT). A British actress, died in London Nov. 6, 1916. She was born in Edinburgh in 1833, the daughter of Thomas Robertson, an art publisher, and made her first stage appearance when 10 years old. Later she appeared with Fanny Kemble and Macready. Going to London she made a reputation for herself in Taylor's *Our Clerks* and other comedies at the Princess's Theatre, married Dion Boucicault in 1853, and came with him to America. Returning to London in 1860, she played successively at the Adelphi, Drury Lane, and other theatres, taking leading parts in several of her husband's dramas, notably as Eily O'Connor in *The Colleen Bawn* (1860), Zoe in *The Octoroon* (1861), and Jane Learoyd in *The Long Strike* (1886). For a time she again lived in America, but in her later life was separated from her husband.

**ROBERTSON, SIR GEORGE SCOTT.** A British soldier, died Jan. 3, 1916, in London. He was born in London in 1852, and after studying at the Westminster Hospital Medical School entered the Indian Medical Service, and served through the Afghan campaign of 1879-80. Afterward he was in the employ of the Indian Foreign Office. He became famous in 1895 when, having reached Chitral on a political mission, he met hostility, and with only 543 men, was besieged in the fortress for six weeks during March and April. Robertson himself was severely wounded before Colonel Kelley was able to come to his relief. For his great service he was made a K.C.S.I. He was distinguished also as a geographer. From 1906 he had represented Central Bradford in Parliament. He published *The Kafirs of the Hindu Kush* (1896) and *Chitral: the Story of a Minor Siege* (1898).

**ROBLINSON, EDWARD ARLINGTON.** See **LITERATURE, ENGLISH AND AMERICAN, Poetry, American.**

**ROCHESTER, UNIVERSITY OF.** A non-sectarian institution at Rochester, N. Y., founded in 1850 for the education of men. There is now a woman's college as part of the university. In the several departments in the fall of 1916 there were 555 students. The faculty numbered 46. During the year Dr. Edwin Fauver was

appointed professor of hygiene and physical education. By a bequest of Lewis P. Roas the university received, in conjunction with the Mechanics Institute, a gift of about \$1,000,000 to found a department of vital economics. On July 1st the productive funds of the institution amounted to \$1,666,177 and during the year 1915-16 it drew an income from these funds of \$84,987. The library contains 72,000 volumes. President, Rush Rhees.

**ROCKEFELLER FOUNDATION.** See ROCKEFELLER PHILANTHROPIC BOARDS.

**ROCKEFELLER INSTITUTE.** See ROCKEFELLER PHILANTHROPIC BOARDS.

**ROCKEFELLER PHILANTHROPIC BOARDS.** ROCKEFELLER INSTITUTE. The various boards established by John D. Rockefeller include the Rockefeller Institute for Medical Research founded in 1901. It has three main departments: the laboratories devoted to investigations in pathology, bacteriology, chemistry, physiology, experimental surgery, and experimental biology; a hospital for special clinical studies; and a department of animal pathology on a farm near Princeton, N. J., to which the Rockefeller Foundation recently apportioned \$1,000,000. In the fiscal year ended June 30, 1916, the institute had total endowment and property valued at \$14,307,854 and reported disbursements of \$507,985.

**GENERAL EDUCATION BOARD.** The General Education Board was chartered by act of Congress in 1903, for "the promotion of education within the United States of America without distinction of race, sex, or creed." It has undertaken to promote practical farming in the Southern States, thus having expended \$940,116; the development of high schools in those same States, thus appropriating \$308,990; the promotion of higher education throughout the United States, having given \$12,435,760 to institutions raising in addition \$46,903,000; the advancement of negro education, to which it has given \$1,123,180; the promotion of medical education, by gifts aggregating \$2,920,874 to the medical schools of Johns Hopkins, Washington University of St. Louis, and Yale University. It has also given \$118,959 for the stimulation of rural education in 11 States; and \$96,493 for educational investigation, research, and experiment. See UNIVERSITIES AND COLLEGES.

**ROCKEFELLER FOUNDATION.** The Rockefeller Foundation, chartered in New York State in 1913 "to promote the well-being of mankind throughout the world," is the most extensive of all these philanthropies. Its endowment Dec. 31, 1915, amounted to \$101,751,749. During 1915 its disbursements amounted to \$14,715,664. Among the objects of its assistance have been the following: the purchase of a tract in Louisiana as a bird refuge; the American Red Cross; the American Academy in Rome; the Annual Foreign Missions Conference of North America; the American Association for the Conservation of Vision; New York Association for Improving the Condition of the Poor; the National Committee for Mental Hygiene; the New York Bureau of Municipal Research; the Colorado State Committee on Unemployment and Relief; the Rockefeller Institute for Medical Research; Johns Hopkins University for the establishment of a School of Hygiene and Public Health; the New York Mayor's Committee on Infantile Paralysis.

The International Health Board was established by the foregoing Foundation in 1913 for the promotion of health throughout the world. Its expenditures in 1915 were \$441,301. It has undertaken the relief and control of uncinariasis or the hookworm disease, the control of yellow fever, and of malaria, wherever found. The China Medical Board was established by the Rockefeller Foundation in 1914 for the purpose of promoting scientific medicine and hygiene in China. It expended in 1915, \$157,623 in aiding medical schools, hospitals, and training schools for nurses. To it the Foundation recently apportioned \$125,000 for a building site. Another undertaking of the Foundation is the investigation of industrial relations under the direction of W. L. Mackenzie King, for which \$19,509 was expended in 1915.

The War Relief Commission was established by the Foundation in 1914 for the study and relief of non-combatant victims of the European war. Its disbursements to Oct. 1, 1916, amounted to \$3,232,043. In October, 1914, this commission went to Europe and began a survey of relief activities in Belgium, Holland, Poland, Serbia, Montenegro, Turkey, and Italy. In consequence it has expended nearly \$1,000,000 for relief work in Belgium, not including the support of Belgian refugees in Holland, England, and Switzerland. It undertook extensive sanitation and relief work in Serbia; expended \$360,000 for relief work in Turkey, Persia, and the Caucasus; gave \$260,000 for the work of the International Committee of the Y. M. C. A. in European prison camps; provided Dr. Alexis Carrel with funds for medical research in a military hospital on the western war front; appropriated on May 24, 1916, \$1,000,000 for relief work in Poland, Serbia, Montenegro, and Albania. (See RELIEF FOR WAR VICTIMS.) In December George E. Vincent, president of the University of Minnesota, accepted the presidency of the Rockefeller Foundation, succeeding John D. Rockefeller, Jr. He stipulated that his salary should remain the same as in his previous position, \$10,000 per year, thus signifying that he made the change only because of the opportunity for larger service.

#### **ROCKY MOUNTAIN SPOTTED FEVER.**

Progress was made in our knowledge of this important disease by the finding of certain bodies in the blood of human beings, white rats, and guinea pigs, suffering from Rocky Mountain spotted fever, by L. D. Fricks, a surgeon in the United States Public Health Service. These bodies he describes as small extra-corpuseular granules, straining bright red and highly refractile, which may be surrounded by a pale halo, and found within or very close to the red blood corpuscles. These granules were most numerous in and around the endothelial cells from the smaller blood vessels, and Fricks believes them to have a causative relation to the disease.

The ticks that convey Rocky Mountain spotted fever pass the earlier cycles of development on chipmunks, ground squirrels, and other small animals, migrating later to horses and cows. The fact that such rodents may serve as hosts for these ticks reduces the efficiency of dipping of horses and cows as a means for the eradication of the ticks. The availability of dipping is further limited by the relatively small area that any one dipping tank can serve, and the

cost of constructing and operating large numbers of such tanks. The use of sheep as an agency for the freeing of tick-infested areas from such infestation was pointed out by Dr. Fricks. Ticks find their way readily into the wool of the sheep as they graze, and in the wool the ticks die or are at least carried forward as the sheep move. The grazing of the sheep from inhabited areas onward to uninhabited mountainous regions would tend toward the destruction of the ticks or the carrying of them to places where they could do comparatively little harm to human beings.

**RODMAN, WILLIAM LOUIS.** An American surgeon, died March 8, 1916, in Philadelphia. He was born at Frankfort, Ky., in 1858 and after graduating from Jefferson Medical College, Philadelphia, in 1879, and serving a year as hospital house surgeon, was from 1880 to 1882 a surgeon in the United States army. From 1885 to 1893 he was connected with the medical department of the University of Louisville, then until 1898 was professor at the Kentucky School of Medicine, and thereafter till his death held the chair of surgery at the Medico-Chirurgical College of Philadelphia. From 1900 he also served as a professor in the Woman's Medical College of the same city. Especially noted for his contributions to the treatment of cancer, Dr. Rodman was elected president of the American Medical College Association in 1902, and of the American Medical Association in 1915, and became a member of and prominent in various other professional societies. He was instrumental in having the National Board of Examiners established. His writings were contributed to surgical journals.

**ROENTGEN RAYS,** or X-RAYS. See PHYSICS.

**ROMAN CATHOLIC CHURCH.** During the year the great war again impeded the orderly administration of the usual details of the intercourse between the Vatican and the various divisions of the Church's establishment throughout the world. Pope Benedict XV was unremitting in his efforts to restore peace. He made a special appeal in a notable letter addressed, on March 4th, to Cardinal Pompili, Vicar of Rome, and inaugurated several movements for the amelioration of the condition of prisoners of war and for the aid of the wounded of all nations and of the starving non-combatants in Poland and Belgium. See WAR OF THE NATIONS.

An important consistory was held by the Pope on December 4th, at which, in his allocution, he announced the completion of the revised Code of Canon Law, which will now be published in five volumes for general distribution throughout the world. The credit for the new Code, the Pope said, was due to his predecessor, Pius X. He also paid a fine and well-deserved tribute to Cardinal Gasparri, Papal Secretary of State, who bore the brunt of the work. Cardinal Gasparri was appointed Camerlengo of the Church, in succession to the late Cardinal della Volpe.

Referring in his address to the present war the Holy Father said:

"It is well to recall, aside from the laws of God, that if even the law of man was obeyed at present, peace and prosperity would reign in Europe. If we neglect or disdain laws and authority, discord is the sure result. This is the highest social law. As a result of ignoring this law we see every principle of right violated

in Europe. . . . I cannot but deplore again these crimes."

The Pope concluded his remarks with the prayer that, as the new Code of Canon Law would mark a more tranquil epoch for the Church, so also the time might come when the spirit of law might again be respected in the world and bring harmony and prosperity to the nations.

The following prelates were then raised to the rank of cardinal: Peter La Fontaine, Patriarch of Venice; Donatus Sbarretti, Assessor of the Holy Office; August Dubourg, Archbishop of Rennes; Louis Ernest Dubois, Archbishop of Rouen; Vittorio Amedeo Ranuzzi de Bianchi, Majordomo of His Holiness; Thomas Pius Boggiani, O. P., Assessor of the Sacred Consistorial Congregation; Alessio Ascalesi, Archbishop of Beneventum; Louis Joseph Maurin, Archbishop-elect of Lyons; Nicholas Marine, Secretary of the Apostolic Segnatura; Orestes Giorgi, Secretary of the Congregation of the Council. The new cardinals average less than 60 years of age, and the Archbishop of Beneventum is only 42. Italy now has 35 cardinals, France 8, Spain 5, and Austria-Hungary 4. Germany and the United States have three each, England and Portugal two each, and Holland, Belgium, Ireland, South America, and Canada one each. Twenty-nine of the 68 cardinals will reside in Rome. Two others, who, rumor says, are the Archbishops of Prague and of Breslau, were reserved *in pectore*. The best known in America of the new cardinals is Donatus Sbarretti, for many years Auditor of the Apostolic Delegation at Washington and later Apostolic Delegate to Cuba and to Canada. No Germans or Austrians were present at this consistory, and none of the new cardinals are of those nationalities. The number of Frenchmen given the red hat was taken as an indication of renewed friendliness between the Papal Court and France.

An important action of the Pope was the ordering, in November, through the Consistorial Congregation of Cardinals, of a new procedure in the method of selecting future bishops for the United States. This act abolishes the old system of the submission of a "terna" of names, chosen by the irremovable rectors, after the death of a bishop, to the bishops of the ecclesiastical province, and in its stead establishes a system of private inquiry by the bishops of each province for the purpose of selecting suitable priests whose names are to be secretly balloted for at a meeting of the bishops held under the presidency of the Archbishop; and the names of those thus chosen are to be forwarded to Rome, so that the Pope can make a selection and an appointment immediately, avoiding in this way the delay which is declared to be the principal reason for changing the present procedure. A special feature of the new system is the strict secrecy *sub gravi* enjoined throughout the inquiry and selection of the three names by the bishops. The Pope, in a letter to the hierarchy of Canada, directed a peaceful settlement of the much vexed dispute over the dual language question in the Catholic schools of the Dominion. Another act announces the introduction of the cause of beatification of Father Isaac Jogues, the first priest to visit New York, John de Brebeuf, Gabriel Lalemand, Anthony Daniel, Charles Garnier, Noel Chabanel, René Goupil, and John

de la Lande, Jesuit missionaries in Canada and the Northwest who were martyred by the Indians.

Two cardinals died during the year, Gotti (q.v.), Prefect of the Propaganda, and della Volpe (see NECROLOGY), Prefect of the Index. There were eight deaths among the American hierarchy: Archbishop J. L. Spalding (q.v.), former Bishop of Peoria; Bishop Doran, auxiliary of Providence, January 10th; Bishop J. W. Shanahan, of Harrisburg, February 19th; Bishop Thomas Brennan, formerly of Dallas, in Rome, March 21st; Bishop Soter Artynsky (q.v.), head of the Ruthenian Greek Catholics; Bishop Harry P. Northrop, of Charleston, S. C., June 8th; and Bishop Henry J. Richter, of Grand Rapids, Mich., December 26th. Prominent laymen among the dead of the year were: Dr. Charles George Herbermann (q.v.), editor-in-chief of the Catholic Encyclopedia; and Thomas M. Mulry (q.v.), president-general of the St. Vincent de Paul Society.

Other changes among the hierarchy were the transfer of Archbishop Harty of Manila to be Bishop of Omaha, and of Bishop John J. Lawler, auxiliary of St. Paul, to be Bishop of Lead, S. Dak. Bishop M. J. O'Doherty of Zamboango, P. I., was made Archbishop of Manila; Mgr. Philip R. McDevitt, of Philadelphia, was appointed Bishop of Harrisburg, and Mgr. William T. Russell, of Washington, D. C., Bishop of Charleston, S. C.; Auxiliary Bishop M. J. Gallagher became Bishop of Grand Rapids, Mich.; and Bishop McCort, of Philadelphia, was appointed Bishop of Los Angeles but declined the transfer. "Catholic Week," August 20th-24th, drew to New York hundreds of delegates from societies all over the country to attend the national convention of the American Federation of Catholic Societies, the German Central Verein, the Young Men's Catholic Union, and the Catholic Press Association.

The joint conventions were opened with Pontifical High Mass in St. Patrick's Cathedral, Sunday, August 20th. At this Mass Cardinals Gibbons, Farley, and O'Connell, and the Apostolic Delegate, Archbishop Bonzano, as well as many other prominent prelates, were present. It was followed by an immense meeting at Madison Square Garden at which Governor Whitman, Acting-Mayor Dowling, the Apostolic Delegate, and the three cardinals all spoke. The feature of the occasion was the speech of Cardinal O'Connell defending the loyalty of Catholics to the principles of their American citizenship. The National Convention of the Knights of Columbus was held at Davenport, Iowa, August 2nd and 3rd, and the International Federation of Catholic Alumnae met at Baltimore, November 23rd-25th. See MINIMUM WAGE.

**STATISTICS.** According to the estimates made for the *Official Catholic Directory* there are 16,564,100 Catholics in continental United States. If to these the Catholics of the island possessions be added there are 24,922,062 Catholics under the United States flag. In the United States proper there are 16,564,109; in the Philippines there are 7,285,458. The additional 1,072,495 are in Alaska, the Canal Zone, in Guam, in American Samoa, in the Hawaiian Islands, and in Porto Rico. The *Directory* states that there are 19,572 Catholic clergymen in the United States. Of these, 14,318 are secular clergy, while 5254 are members of religious orders.

The publication also lists: 10,058 Catholic churches with resident priests; 5105 mission churches; 85 seminaries with 6201 students studying for the priesthood; 112 homes for aged; 210 colleges for boys; 685 academies for girls; 5588 parochial schools, in which there are enrolled 1,497,949 children; and 283 orphan asylums with 48,089 orphans. Further figures show that the 26 States having a Catholic population of over 100,000 are: New York, 2,899,223; Pennsylvania, 1,802,977; Illinois, 1,479,291; Massachusetts, 1,400,834; Ohio, 903,102; Michigan, 597,000; New Jersey, 593,000; Louisiana, 586,400; Wisconsin, 577,823; California, 518,163; Missouri, 490,000; Minnesota, 470,361; Connecticut, 469,701; Texas, 412,190; Rhode Island, 275,000; Maryland, 261,000; Iowa, 257,400; Indiana, 249,426; Kentucky, 171,871; New Mexico, 140,573; New Hampshire, 134,000; Maine, 131,638; Kansas, 126,980; Nebraska, 120,761; Colorado, 110,384; North Dakota, 103,471.

See also NATIONAL BIRTH CONTROL LEAGUE.

**ROMANCE PHILOLOGY.** See PHILOLOGY, MODERN.

**ROME.** See ARCHÆOLOGY.

**ROOSEVELT, THEODORE.** See LITERATURE, ENGLISH AND AMERICAN, *History, etc.*, and *Travel*, American; UNITED STATES, *Presidential Campaign*; UNITED STATES AND THE WAR.

**BOOT, ELIHU.** See LITERATURE, *Essays*; UNITED STATES, *Presidential Campaign*.

**ROVE TUNNEL.** See CANALS, *Marseilles-Rhône Canal*; TUNNELS.

**ROWING.** The United States again had a monopoly in the rowing world in 1916, the historic Henley Regatta of England having been abandoned for the second year in succession on account of the war. The victory of the Syracuse University varsity eight in the intercollegiate regatta on the Hudson was the noteworthy feature of the rowing season. This crew, coached by James Ten Eyck, was, in the opinion of experts, the most formidable aggregation of oarsmen that has ever been turned out by an American college.

Harvard obtained revenge for the defeat suffered at the hands of Yale in the preceding year by making a clean sweep of the races contested on the Thames.

Amateur rowing proved popular, the entry list for the annual regatta at Duluth, Minn., being the largest ever received. Tom Rooney of the Ravenswood Boat Club, Flushing, L. I., distinguished himself by capturing the national singles title after a thrilling race with John B. Kelly of the Vesper Boat Club of Philadelphia. Robert Dibble of the Don Rowing Club of Toronto, Canada, holder of the title, was unable to compete, owing to his enlistment in the British army.

The times made by the various eight-oared varsity crews in the intercollegiate regatta on the Hudson were: Syracuse, 20 minutes, 15 seconds; Cornell, 20:22%; Columbia, 20:41%; Pennsylvania, 20:62%.

Syracuse also carried off the honors in the junior eight-oared race, covering the 2 miles in 11 minutes, 15% seconds. The times for the other crews were: Cornell, 11:20%; Columbia, 11:32; Pennsylvania, 12:06%.

The freshmen eight-oared race at 2 miles was captured by Cornell, whose time was 11 minutes, 5% seconds. The other crews finished

as follows: Syracuse, 11:15%; Pennsylvania, 11:16%; Columbia, 11:23%.

Harvard, in triumphing over Yale at New London, went over the 4-mile course in 20 minutes, 2 seconds. Yale's time was 20:17. The Crimson oarsmen also captured the second varsity eight-oared event, the time being 10 minutes, 25 seconds, as against Yale's 10:27. The freshmen from Cambridge followed in the wake of their elders by winning their race with the Eli youngsters. The times were: Harvard, 10 minutes, 36% seconds, Yale, 10:39.

In college dual and triangular meets during 1916 Harvard defeated Cornell; Princeton defeated Harvard; Pennsylvania defeated Yale; Leland Stanford defeated California; Washington defeated Leland Stanford; Navy defeated Pennsylvania; Princeton defeated Navy, Columbia, and Pennsylvania; Cornell defeated Princeton.

The 44th annual championships of the National Association of Amateur Oarsmen were held at Duluth, Minn. The Duluth Boat Club, for the second successive year, carried off the majority of the laurels. The winners in the more important events were: Junior eight-oared shells, Duluth B. C.; senior eight-oared shells, Duluth B. C.; intermediate eight-oared shells, Duluth B. C.; senior sculls, Tom Rooney; intermediate sculls, E. Henkel; association sculls, Tom Rooney.

The 13th annual regatta of the American Rowing Association, popularly known as the American Henley, was held at Philadelphia. The winners of the principal events were: Eight-oared shells for Childs Cup, Princeton; junior collegiate eight-oared shells, Syracuse; freshmen eight-oared shells, Yale; first single sculls, John B. Kelly; interscholastic eight-oared shells, Central High School, Philadelphia.

**ROYCE, JOSIAH.** An American philosopher, died at Cambridge, Mass., Sept. 14, 1916. He was born in Grass Valley, Nevada County, Cal., Nov. 20, 1855, graduated at the University of California in 1875, studied at Leipzig, Göttingen, and Johns Hopkins (Ph.D., 1878), and in 1878 was appointed instructor in English in the University of California. He became instructor in philosophy at Harvard University in 1882, assistant professor there in 1885, professor of the history of philosophy in 1892, and in March, 1914, Alford professor of natural religion, moral philosophy, and civil polity. His earlier writings, not in philosophy, include: *A Primer of Logical Analysis, for the Use of Composition Students* (1881); *California from the Conquest in 1846 to the Second Vigilance Committee in San Francisco* (1886); *The Feud of Oakfield Creek* (1887), a novel. His philosophical and later publications are: *The Religious Aspect of Philosophy* (1885); *The Spirit of Modern Philosophy* (1892); *The Conception of God* (1897), jointly; *Studies of Good and Evil* (1898); *The Conception of Immortality* (1900); *The World and the Individual* (2 vols., 1900-01), the Gifford lectures at Aberdeen University; *Psychology* (1903); *Herbert Spencer: An Estimate and a Review* (1904); *The Relation of the Principles of Logic to the Foundations of Geometry*, in the *Transactions of the American Mathematical Society*, July, 1905; *Philosophy of Loyalty* (1908); *Race Questions, Provincialism, and Other American Problems* (1908); *William James and Other Essays on the Philosophy of*

*Life* (1911); *Sources of Religious Insight* (1912); *The Problem of Christianity* (2 vols., 1913); *War and Insurance* (1914); *The Hope of the Great Community* (posthumous, 1917).

In metaphysics Royce won international recognition as one of the ablest exponents of absolute idealism, with emphasis laid on individuality, both finite and infinite, and on will rather than on intellect. The foremost opponent of pragmatism and the new realism, and of the English empiricism from which they are derived, he was vigorously criticised by adherents of those systems, but defended his position with a vigor and wealth of thought rarely exceeded. The moral issues raised by the outbreak of the European war strongly moved him to state his views in several public addresses. Professor Royce served as president of the American Philosophical Association and of the American Psychological Association (1901). He was also elected a member of the National Academy of Sciences and of the National Institute of Arts and Letters and a fellow of the American Academy of Arts and Sciences. Yale, Johns Hopkins, Harvard, Aberdeen, St. Andrews, and Oxford gave him honorary degrees. Consult G. H. Howison, *Josiah Royce* (1916).

**RUBBER.** The year 1916 was in every way remarkable in the rubber industry, all the way from the production of crude rubber to the manufacture of various articles which long since had become indispensable in the daily economy of the world. The mere manufacture of tires for motor vehicles by American factories required practically one-half the world's production of crude rubber, but in other fields the demand increased, and more and more European nations were dependent upon American manufactures, especially under the unusual conditions brought about by the war.

The world's production of crude rubber in 1916 was estimated at between 178,000 and 198,000 tons, or an increase of from 32,000 to 52,000 tons over 1915, when the production was placed at 146,000 tons. This greater production was due largely to increased yield from the plantations of the Far East, as in 1916 about 75 per cent of the grand total amount came from these regions, which as recently as 1905 supplied but 145 tons as compared with between 140,000 and 150,000 in 1916, with a constantly increasing acreage and yield per acre. This increased production by special arrangement with the British government on the part of American rubber manufacturers was largely available in the United States, and in 1916 such imports amounting in value to some \$125,000,000 served to influence American exchange to the benefit of Great Britain. These imports began to come in considerable amounts to the Pacific coast, thus avoiding the war zones and the perils of submarines.

The total production of crude rubber in 1916 as estimated by the *India Rubber World* (New York), along with the production of the two previous years, is given in the accompanying table:

WORLD'S PRODUCTION OF CRUDE RUBBER

	1916	1915	1914
Ceylon and India, . . . . . tons	24,500	20,800	14,800
Malaya, etc. . . . .	105,500	72,800	49,700
Amazonas (Brazil, Bolivia, and Peru) . . . . .	28,255	80,700	28,345

	1916	1915	1914
Peruvian and Caucho .....	8,245	6,800	8,655
West Coast, Africa.....	2,000	2,500	2,650
Benguela and Mossamedes..		1,900	1,500
Loanda .....		600	450
Congo, French Congo and Sudan .....	5,000	3,000	3,900
From other sources .....	4,500	7,100	10,380
<b>Totals .....</b>	<b>178,000</b>	<b>146,000</b>	<b>120,880</b>

These statistics show that the production of South American rubber was somewhat increased, although including more Caucho ball and less *Mawicoba* and Assare. Practically all the Amazon rubber was consumed in 1916. Central America exported very little and almost no guayule.

Increased amounts were received from Congo, French Congo, and Sudan, but very little was received from East Africa and Madagascar. Penang increased its supply of wild rubber twofold, while Sumatra, Java, and Borneo exported less Rambong rubber but more *Hevea*. The production of jelutong and balata decreased considerably.

It should be borne in mind in considering statistics for rubber production that the rubber ton is 2240 pounds avoirdupois and figures for wild rubber are of different significance from those for plantation rubber. With the former there is a loss in washing and drying equal to 20 per cent of a fine Para rubber and 30 per cent for all other wild rubbers. In the case of plantation rubbers the figures refer to washed and dried rubber, and the same consideration applies where price quotations are given, this circumstance accounting in large part for the difference. Making allowance, therefore, for the essential difference in the two main classes of crude rubber, the figures given above are of interest for purposes of comparison and indicating the total production on the basis of careful estimates.

As stated above, there was increased yield of plantation rubber in the Far East, due not only to greater plantation acreages, but chiefly to increased yields per acre.

The accompanying estimates indicate the acreage of the various colonies for the years 1914, 1915, and 1916.

	1916	1915	1914
Ceylon .....	230,000	230,000	220,000
Malaya, Malacca .....	600,000	550,000	500,000
Borneo .....	30,000	20,000	20,000
Dutch East Indies, Java, Sumatra, etc. ....	500,000	450,000	400,000
India and Burma .....	40,000	40,000	65,000
German colonies, Samoa, East and West Africa.	12,000	12,000	40,000
<b>Totals .....</b>	<b>1,412,000</b>	<b>1,302,000</b>	<b>1,245,000</b>

The plantations, chiefly of *Castilloa*, in Mexico, West Indies, and Central and South America in 1916 showed no progress and the yields were insignificant. The same was true of Ceara plantations in East Africa.

The price of crude rubber in New York varied from high records of \$1.05 per pound for First latex crepe spot and \$1.00 Upriver fine spot in January, to low levels in June and July with a gradual increase to 78 cents at the end of the year for Upriver fine and 79 cents for First latex. Average prices for Upriver and Islands rubber and Cameta for the years 1911 to 1916 were:

	Upriver		Islands		Cameta
	Fine	Coarse	Fine	Coarse	
1916 .....	\$0.74	\$0.50	\$0.66	\$0.38	\$0.35
1915 .....	.61%	.47%	.55%	.30%	.33%
1914 .....	.73%	.47%	.68%	.31%	.35%
1913 .....	.87%	.58%	.79%	.36%	.42%
1912 .....	1.11%	.89%	1.05%	.59%	.68%
1911 .....	1.18%	.95%	1.10%	.64%	.70%

The consumption of crude rubber of the various grades was estimated as follows by the *India Rubber World*:

	1916	1915	1914
England .....	25,000	24,000	18,000
Germany, Austria, etc. ....	1,500	3,000	16,480
France .....	8,500	7,000	5,000
Russia .....	20,000	16,000	11,610
Italy, etc. ....	4,000	2,500	4,000
Japan and Australia.....	5,000	4,000	2,400
America and Canada .....	114,000	89,500	62,940
<b>Totals .....</b>	<b>178,000</b>	<b>146,000</b>	<b>120,880</b>

All countries reported increased consumption except the Teutonic nations, from whom supplies were largely cut off, the United States, Russia, and Italy being most conspicuous. Scandinavian countries and Spain were manifesting increased activity in the rubber industry.

On the technical side there were continued advances in rubber manufactures due to the great activity of the chemists of the industry. Improved methods of analysis were being developed as well as aging tests, while by the use of various chemicals for accelerators, the time required for vulcanization was decreased by at least one-half and the amount of production correspondingly doubled. For the dry heater a method of pressure curing was substituted in the manufacture of footwear and was thought to be applicable with advantage to other branches of the industry, such as the manufacture of clothing, mackintoshes, and carriage cloth. With the high prices and shortage of sole leather there was developed commercially a combined rubber and fibre or leather sole for which a wide application seemed promised. In vulcanization cold methods were being improved and a process of hot vulcanization without the use of sulphur was announced from Russia as a recent discovery with possibilities. Little progress was made during 1916 with synthetic rubber either in Germany or the United States; high cost being a leading obstacle of the methods already developed and, especially in America, the activity of competent chemists was being turned to more useful fields.

While the rubber industry was active in all fields in the United States, the growth in the manufacture of automobile tires was phenomenal, having to keep pace as it did with the large number of automobiles (q.v.). In addition, the export business had grown by leaps and bounds and the total United States exports of motor tires for the years ended June 30 were as follows:

1914 .....	\$ 3,505,267
1915 .....	4,963,270
1916 .....	17,938,227

The calendar year 1916 was expected to show an even greater gain, as the eight months ending August, 1916, had exports practically double those of the corresponding period in 1915. Naturally much of the rubber exported was in

the form of other war material as well as tires. Rubberized fabrics for army equipment and aeroplanes were in demand, while more than ever before was rubber employed in surgery to replace broken bones or features around which skin could be grafted, or used for artificial limb construction. In conclusion it might be said that American enterprise was reaching out into the Far East to acquire land or plantation for rubber cultivation in Malaya and elsewhere, and this tendency was being looked at with feelings of hostility by many British planters. See CHEMISTRY, INDUSTRIAL.

**RUBBER, ARTIFICIAL.** See CHEMISTRY, INDUSTRIAL.

**RUBY.** See MINERALOGY.

**RUMANIA.** A constitutional European monarchy, hereditary in the male line of Charles I of the house of Hohenzollern. It is composed of the former principalities of Moldavia and Wallachia, with the territory of the Dobruja and, as a result of the wars in the Balkans, a strip of territory acquired from Bulgaria, between the Danube and the Black Sea. Bucharest, the capital, was abandoned by the Rumanian government Nov. 27, 1916, which moved to Jassy on this date. Bucharest, the old Wallachian capital (next to Paris the largest fortress in the world), was made the capital of the new nation which was formed in 1861 by the union of Wallachia and Moldavia. Jassy was the capital of Moldavia and was to receive a sum equivalent to \$700,000 in return for her lost prestige; but the money was never paid. The population (1914 estimate) of Bucharest was given at 345,628 and that of Jassy at 76,120. Bucharest was taken by the Germans Dec. 6, 1916. Area and population according to the census of 1913 were 137,907 square miles and 7,509,009.

Rumania is not a Balkan state, and took no part in the operations of the Balkan League (Bulgaria, Serbia, Montenegro, and Greece) against the Ottoman Empire in 1912-13; but during the second war (1913), when Bulgaria was in opposition to the remaining members of the League, Rumania was able to extract terms from Bulgaria at the Treaty of Bucharest, by which a "quadrilateral" of Bulgarian territory, amounting to 7609 square miles, with a population of 285,000, was surrendered to Rumania. Principal towns, Siljstria and Dobritsi. Population (1914) of Galatz, 72,512; Braila, 65,911; Ploeshti, 57,376; Craiova, 51,877; Botoshani, 32,874; Buzau, 29,483; Constantza, 27,662; Berlad, 25,367.

The surplus of births over deaths in 1914 was 144,396; in 1913, 117,936; 1912, 148,474; 1910, 100,263.

**PRODUCTION.** The grain-growing Wallachian district was at the end of 1916 largely overrun by the German invaders. As outlet to the sea has been blocked since the beginning of the European war, enormous quantities of grain intended for export must have been stored; for Rumania is, after Russia, the most considerable grain exporter in the eastern hemisphere. It has been reported from Bucharest that the retreating Rumanian armies set fire to all stores along their line of march. German reports contradicting the efficacy of these measures assert the capture of great quantities of both grain and oil. The main seat of the petroleum industry (in which was invested a large amount of German capital) is in the mountains northwest of

Bucharest. If the Rumanians succeeded in blowing up the works and setting the wells on fire over a considerable territory, a prime object of Germany in the invasion of the country will have been defeated. If, on the contrary, time was lacking in which to destroy the stores, Germany will have gained quantities of oil to operate her Diesel engines and gasoline motors, grain to stop the many mouths of German hunger, cattle (3,000,000), sheep (5,000,000), and pigs (1,000,000) to restock the depleted German larder, and a clear road by the Danube for the transportation of stores into Germany and the exit, by way of the Black Sea into the Mediterranean, of German submarines. A glance at a table of visible supplies—stocks existing in private depots, in mills, in railway stations, on port quays, and in silos, Dec. 31, 1915, as compared with stocks on Nov. 30, 1915, and Dec. 31, 1914—may be of special interest (quantities in quintals):

	Dec. 1915	Nov. 1915	Dec. 1914
Wheat .....	13,446,977	13,100,975	2,789,162
Rye .....	557,944	410,864	145,652
Barley .....	5,851,968	5,851,968	1,650,755
Oats .....	2,532,964	3,095,924	794,690
Corn .....	14,666,795	15,714,749	5,202,707
Wheat flour.....	447,935	472,285	375,473

A statement purporting to be based on an official report returns the following statistics for 1914 regarding the distribution of agricultural lands: 13,074,922 acres tillage, 1,299,382 fallow, 1,436,960 meadow, 2,948,472 pasture, 468,670 vine and orchard lands, 5,705,750 forest.

In the following table are shown for 1914-15 and (preliminary figures) for 1915-16 the area under principal crops, the production in thousands of metric quintals, and the yield in quintals per hectare in 1914-15:

	Hectares		1000 Qs.		Qs.
	1914-15	1915-16	1914-15	1915-16	
Wheat ..	1,904,249	1,960,188	24,486	21,470	12.8
Rye .....	78,613	80,780	744	.....	9.8
Barley ..	554,900	588,807	6,321	6,540	11.4
Oats .....	430,968	432,245	4,345	4,200	10.1
Corn .....	2,107,289	2,046,098	25,000	.....	11.9
Flax .....	5,850	7,915	22,062	.....	.....
Beets * ..	18,838	12,807	.....	.....	.....
Vines † ..	83,549	86,934	1,671	.....	.....
Tobacco ..	13,044	9,664	.....	.....	.....
Potatoes ..	11,288	14,051	.....	.....	.....

\* Sugar beets. † Production in thousands of hectolitres.

The petroleum output for 1915 was 1,673,145 metric tons, of which 429,087 metric tons were exported (154,688 to Germany, 255,699 to Austria-Hungary). Output, 1914, 1,783,957 metric tons; export, 654,024 (108,144 to Italy, 99,164 to Germany, 84,253 to Austria-Hungary, 77,971 to the United Kingdom).

**COMMERCE.** The export of wheat since Oct. 3, 1914, of wheat flour since Sept. 30, 1914, of oats since August 7th, and of rice since Aug. 1, 1914, has been prohibited. By decree of March 15th, the export of barley and rye has been prohibited. By royal decree of July 30, 1915, the prohibition of the export of wheat, rye, barley, oats, corn, and linseed, was removed and an export duty levied at the rate of six francs per quintal on wheat, rye, and flour, five francs per quintal on barley, oats, and meal, four francs per quintal on corn, and ten francs per quintal on linseed.



In the table below are shown imports and exports for three years, in lei:

	1911	1912	1913
Imports .....	616,504,872	637,905,560	590,012,640
Exports .....	691,720,408	642,103,788	670,705,835

In thousands of lei are given below imports and exports by great classes for 1912 and 1913:

	Imports		Exports	
	1912	1913	1912	1913
Animals & an. prods.	123,236	92,162	24,453	21,750
Agricultural prods.	213,506	167,360	544,207	511,035
Mineral prods.	175,981	180,471	71,504	136,652
Other prods.	125,183	141,020	1,940	1,268
Total .....	637,906	590,013	642,104	670,705

Details of the 1913 trade are given in the table below, values in thousands of lei:

Imports	1000 l.	Exports	1000 l.
Metals and mfrs.	173,075	Cereals, etc.	448,412
Textiles	64,902	Petroleum	131,481
Machinery	59,053	Legumes, etc.	34,124
Woolens	33,069	Timber, etc.	23,718
Explosives	31,171	Animal products	11,246
Vehicles	27,260	Live animals	2,899
Apparel	21,711	Metals, etc.	3,956
Skins, etc.	21,716	Wool	2,934
Silks	16,148	Hides, etc.	3,253
Woolen wares	23,026	Paper	1,265

Below are shown the most important cereal exports for 1912 and 1913, in thousands of lei:

Exports	1912	1913	Exports	1912	1913
Wheat	256,509	208,152	Oats	24,439	22,140
Maize	146,699	115,765	Millet	2,875	1,604
Barley	87,288	48,341	Flour	22,607	34,044
Rye	9,388	9,023	Bran	5,081	5,832

The principal countries of origin and destination follow, values in thousands of lei for 1912 and 1913:

	Imports		Exports	
	1912	1913	1912	1913
Austria-Hungary	240,435	237,819	42,536	52,408
Bulgaria	138,874	138,192	94,750	95,858
United Kingdom	88,000	55,738	48,041	44,840
Germany	39,063	34,136	49,948	63,526
Egypt	12,874	31,937	1,062	108
Netherlands	37,075	21,887	121,066	71,308
Russia	20,150	16,493	152,999	182,023
United States	14,827	15,256	25,869	36,853
France	16,536	12,905	6,226	3,651

Vessels entered in the 1913 trade numbered 32,499, of 10,253,223 tons; cleared, 32,306, of 10,176,885. The merchant marine included, Jan. 1, 1915, 133 steamers, of 40,949 tons, and 624 sailing, of 197,799—total 757, of 238,748 tons.

COMMUNICATIONS. The railway from Bucharest to Constantza on the Black Sea crosses the Danube at Chernavoda on one of the longest bridges in the world—11 miles. This bridge was blown up by the retreating Rumanian armies in October, 1916.

The railroads leading from the frontiers to Bucharest were in possession of the invaders by the end of the year, with telegraphs, telephones, post offices, and all the internal mechanism of administration comprehended within the invaded territory.

FINANCE. The monetary unit is the leu (par value, 19.295 cents). The actual revenue and expenditure for years indicated are in lei:

	1897-98	1909-10	1913-14
Revenue .....	210,838,729	522,842,688	608,502,889
Expenditure .....	217,335,486	481,921,854	512,253,722

The details of the 1915-16 budget, which are the latest available, are found in the 1915 YEAR BOOK.

GOVERNMENT. The two autonomous provinces of the Ottoman Empire, Moldavia and Wallachia, combined with the Dobruja, Dec. 23, 1861, to form an independent kingdom. The king is the executive, assisted by a council of eight ministers. A Senate (120 members) and a Chamber of Deputies (183) compose the legislative body. Reigning King, Ferdinand, nephew of Charles I, who was the son of Prince Charles of Hohenzollern-Sigmaringen; he came to the throne Oct. 11, 1914. He married (Jan. 10, 1893) an English princess—Mary, daughter of the Duke of Saxe-Coburg and Gotha. They have six children, the crown prince Charles (born Oct. 15, 1893), being the eldest. The King is the second son of the elder brother of the late sovereign, who came to the throne in 1866 upon the deposition of Prince Alexander John, who was proclaimed king instead of prince in 1881. He married (1869) Princess Elizabeth von Wied, popularly known as Carmen Sylva.

HISTORY. At the beginning of the year there was great uncertainty among the belligerents as to the course that Rumania would take. At that time, however, circumstances seemed to favor the Entente Allies, although the campaign of the German party continued. M. Carp, the former Prime Minister, visited Vienna. On the other hand, MM. Filipesco and Jonesco of the Opposite party paid visits respectively to Petrograd, London, and Paris. In general, the Brătianu cabinet seemed to try to preserve the balance between the belligerents; the government sold cereals to both sides. There were rumors of a crisis in the relations with the Central Powers in February, when it was reported that two representatives from the Hungarian province of Transylvania, known as "unredeemed" Rumania, had presented themselves for election, but on April 7th the government signed a convention with Germany for the free exchange of domestic products between the two countries and on May 15th a similar convention was made with Austria-Hungary. Parliament adjourned on April 9th, after approving a domestic loan of \$30,000,000 and voting a graduated tax on certain articles of luxury, as, for example, jewelry and automobiles.

On August 28th Rumania definitely entered the war on the side of the Entente Powers. For details, see the article WAR OF THE NATIONS. In the middle of October King Ferdinand explained the course of Rumania in entering the war on the side of the Allies as not due to any mere policy of expediency, and as not indicating bad faith to the Central Powers, but as based on large principles of nationality. Hungary was the hereditary enemy of his people, inasmuch as she held millions of their kindred in political bondage. There was no hostility toward Germany but rather friendship, since Germany from an economical point of view was an aid to Rumanian development. He defended the inactivity for which Rumania had been criticised, saying that as a small power with a small army and with a western frontier nearly 700 miles long, she was obliged to wait until she thought

she had a reasonable prospect of protecting herself and of having the support of the Allies. At the end of the year an address was issued by the Chamber of Deputies defying the enemy, declaring that the Rumanian army was not yet destroyed, and giving assurance that it would continue its resistance. It promised the peasantry, which, it said, made up the largest and most patriotic part of the army, their political and economical liberty in accordance with the solemn acknowledgment which had been made to them a few days before by the King. It said that as soon as victory was won, they would be placed in as favorable a position as regards their rights as any other class. It concluded with a patriotic declaration that since more than once Rumania had been able to drive out the enemy from her borders, she awaited with confidence the moment when she should again be free.

**RUMFORD MEDAL.** This medal of the American Academy of Arts and Sciences was awarded in 1916 to Dr. Charles G. Abbott, director of the Astrophysical Laboratory of the Smithsonian Institution.

**RURAL CREDIT.** See AGRICULTURAL CREDIT.

**RUSSELL, CHARLES TAZE.** ("Pastor Russell"). An American clergyman, died on board a train at Pampa, Texas, Nov. 1, 1916. He was born at Pittsburgh, Pa., in 1852, and was educated principally under private tutors. He began an independent ministry at Pittsburgh in 1878, and preached the doctrine that there is no other hell than that on earth, and interpreted the punishment of the Bible to be eternal death and not eternal torture. He soon had a large following. In 1881 the Watch Tower Bible and Tract Society of Pennsylvania was incorporated, with Pastor Russell as president. He removed to Philadelphia, and in 1909 came to Brooklyn, where he founded the People's Church. His popularity became so great that he had to preach in the Brooklyn Academy of Music. He publicly asked for no financial aid, but is understood to have received large contributions from wealthy followers. He traveled widely in his work, ministered to congregations all over the United States, and established a Tabernacle in 1911 in London. He toured the world in 1912. He edited the *Watch Tower and Herald of Christ's Presence*, a semi-monthly publication, and since 1886 had issued *Studies in the Scriptures*. His Sunday sermons were published by about 2000 newspapers.

**RUSSELL, GEORGE W.** See LITERATURE, ENGLISH AND AMERICAN, *Essays, etc.*, English.

**RUSSIA.** An empire of eastern Europe and northern Asia, extending from the Baltic to the Bering and from central Europe and Asia to the Arctic Ocean. An original member of the Triple Entente in the War of the Nations. Capital, Petrograd.

**AREA AND POPULATION.** The results of the annual estimate of population as returned Jan. 1, 1914, are given in the table below, together with density per square mile. The area is also given, in English square miles, for the purpose of showing relative extent of great divisions and their provinces or governments; but the total area in the table differs somewhat from the official total—19,099,866.9 square versts = 21,741,600 square kilometers = 8,394,018 square miles, without internal waters. Including Bokhara (203,430 square kilometers, 1,500,000 inhabitants), Khiva (67,430 kilometers, 800,000 inhab-

itants), and the inland seas (Caspian, 438,690; Azov, 37,600; Aral, 67,770), the total area of the empire is given as 22,556,520 square kilometers, or 8,709,116 square miles; total population, census 1897, 126,896,200.

	Sq. miles	Pop. 1914	D.
<b>1. European Russia:</b>			
Arkhangelsk .....	826,068	483,500	1.5
Astrakhan .....	91,042	1,315,900	14
Bessarabia .....	17,143	2,657,300	155
Chernigov .....	20,232	3,181,500	154
Courland .....	10,435	798,300	76
Don, Province of ..	68,532	3,876,000	61
Esthonia .....	7,605	507,200	66
Grodno .....	14,896	2,048,200	138
Kaluga .....	11,942	1,476,600	124
Kazan .....	24,587	2,867,000	117
Kharkov .....	21,041	3,416,800	162
Kherson .....	27,337	3,744,600	137
Kholm .....	5,218	1,087,800	209
Kiev .....	19,676	4,792,500	243
Kostroma .....	32,432	1,822,600	56
Kovno .....	15,518	1,857,100	119
Kurak .....	17,937	3,256,600	182
Livonia .....	17,574	1,744,000	99
Minsk .....	85,220	3,035,800	86
Moghilev .....	18,514	2,465,600	133
Moscow .....	12,847	3,591,300	279
Nizhni-Novgorod ..	17,789	2,066,800	104
Novgorod .....	45,770	1,671,500	36
Olonets .....	49,355	465,600	9
Orel .....	18,042	2,761,700	153
Orenburg .....	78,254	3,170,800	30
Penza .....	14,997	1,911,600	127
Perm .....	127,502	4,007,500	31
Petrograd .....	17,226	3,136,500	182
Podolia .....	16,224	4,057,800	250
Poltava .....	19,265	3,792,100	197
Pskov .....	16,678	1,425,100	85
Ryazan .....	16,190	2,778,900	171
Samara .....	58,320	3,800,800	65
Saratov .....	32,624	3,269,300	100
Simbirsk .....	19,110	2,067,800	108
Smolensk .....	21,624	2,163,600	100
Tambov .....	25,710	3,580,000	137
Taurida .....	23,312	2,059,300	87
Tula .....	11,954	1,886,200	157
Tver .....	24,975	2,394,100	96
Ufa .....	47,109	3,099,300	66
Vilna .....	16,181	2,075,900	128
Vitebsk .....	16,988	1,953,100	115
Vladimir .....	18,821	2,027,000	107
Volhynia .....	27,699	4,189,000	151
Vologda .....	155,265	1,751,600	11
Voronesh .....	25,443	3,630,900	143
Vyatka .....	59,329	3,996,700	66
Yaroslavl .....	13,723	1,297,700	95
Yekaterinoslav ...	24,477	3,455,500	141
<b>Total E. R. ....</b>	<b>1,867,737</b>	<b>128,864,800</b>	<b>69</b>
<b>2. Poland:</b>			
Kaliss .....	4,377	1,342,400	306
Kieice .....	3,897	1,029,800	264
Lomza .....	4,588	819,700	179
Lublin .....	6,297	1,481,000	235
Piotrków .....	4,730	2,097,900	443
Plock .....	3,541	786,000	217
Radom .....	4,769	1,180,200	248
Suwalki .....	4,756	718,000	151
Warsaw .....	6,749	2,792,600	414
<b>Total Poland...</b>	<b>43,804</b>	<b>12,247,600</b>	<b>280</b>
<b>3. Ciscaucasia:</b>			
Kuban (province)..	36,645	2,984,500	81
Stavropol .....	20,970	1,829,000	63
Terek (province)..	28,158	1,261,300	45
<b>Total Ciscaucasia</b>	<b>85,768</b>	<b>5,574,700</b>	<b>65</b>
<b>4. Transcaucasia:</b>			
Baku .....	15,061	1,100,400	73
Batum (province)..	2,698	183,100	68
Black Sea .....	3,220	152,700	47
Daghestan (prov.)..	11,471	724,200	63
Yellavetpol .....	16,991	1,098,000	65
Erivan .....	10,725	1,018,800	95
Kars (province) ..	7,239	396,200	54
Kutais .....	8,145	1,067,700	131
Sukhun (district)..	2,545	146,400	57
Tiflis .....	15,776	1,359,600	86
Zakataly (district)	1,539	100,400	65
<b>T<sup>1</sup> Transcaucasia</b>	<b>95,405</b>	<b>7,847,000</b>	<b>77</b>

	<i>Sq. miles</i>	<i>Pop. 1914</i>	<i>D.</i>
<b>5. Siberia:</b>			
Amur (province)...	154,795	250,400	1.6
Irkutsk (govt.)...	280,429	750,300	2.6
Kamchatka (pr.)...	502,424	40,500	0.08
Primorskaya (pr.)...	266,486	606,600	2.2
Sakhalin (pr.)...	14,688	83,500	2.3
Tobolok (govt.)...	535,789	2,054,400	3.8
Tomsk (govt.)...	827,173	3,999,000	10.3
Transbaikalia (pr.)...	258,808	945,700	3.9
Yakutsk (prov.)...	1,580,253	380,000	0.2
Yeniseisk (govt.)...	981,607	990,400	1.0
<b>Total Siberia...</b>	<b>4,881,882</b>	<b>10,000,700</b>	<b>2.7</b>
<b>6. Steppes:</b>			
Akmolinak .....	250,074	1,523,700	6.8
Semipaltinsk .....	178,320	867,500	4.9
Turgai .....	169,832	697,700	4.1
Uralk .....	187,679	867,100	6.8
<b>Total Steppes...</b>	<b>710,905</b>	<b>3,956,000</b>	<b>5.6</b>
<b>7. Turkestan:</b>			
Ferghana .....	55,483	2,134,000	38
Samarkand .....	26,627	1,198,000	45
Syr-Daria .....	194,147	2,012,300	10
Semiryechensk ...	144,550	1,269,300	8.8
<b>Total Turkestan.</b>	<b>420,807</b>	<b>6,613,600</b>	<b>15.7</b>
<b>8. Trans-Caspian Prov.</b> 235,120 588,900 2.8			
<b>Total Russian Empire..</b>	<b>8,291,429</b>	<b>175,187,800</b>	<b>21.1</b>
Finland .....	125,689	8,241,000	25.0
<b>Total land.....</b>	<b>8,417,118</b>	<b>178,878,800</b>	<b>23.0</b>
<b>Internal waters.</b>	<b>847,468</b>		
<b>Total .....</b>	<b>8,764,586</b>	<b>178,878,800</b>	<b>23.0</b>

	<i>Pop.</i>	<i>Poland:</i>	<i>Pop.</i>
European Russia:			
Gomel .....	104,582	Wielawek (08)	37,408
Tsaritsyn (10)	100,817	Plock .....	35,190
Orenburg .....	100,180	Slodce (10)...	34,072
Ufa .....	99,900	Kielce .....	33,090
Kremenchug ..	98,895	Lomna .....	33,090
Byelostok .....	98,170	Suwalki .....	32,962
(12) .....	96,300	Zyrdardow (10)	32,029
Orel .....	96,158		
Kherson .....	96,065	<b>Finland:</b>	
Reval .....	93,700	Helsingfors ...	161,091
Voronezh .....	90,980	Abo .....	52,057
Kovno .....	90,744	Tammerfors ...	46,192
Libava (11)...	90,720	Viborg .....	28,257
Zhitomir .....	87,946	Nicolaistad ...	28,275
Poltava .....	87,820	Uleaborg .....	21,271
Kurak .....	81,859		
Simferopol ...	79,151	<b>Caucasus:</b>	
Berdichev ...	78,960	Tiflis .....	307,800
Penza .....	75,800	Baku .....	232,200
Yeliasvetgrad	75,183	Sallany (10)...	120,904
(10) .....	71,220	Yekaterinodar ..	107,360
Smolensk .....	70,472	Vladikavkas ...	79,848
Tambov .....	70,000	Novorossiisk ...	66,180
Chelyabinsk ..	69,707	Stavopol .....	64,100
(10) .....	69,146	Yeliasvetpol	
Yekaterinburg	68,700	(10) .....	60,447
(10) .....	68,273	Kutais .....	53,640
Mohilev-on-	68,091	Maikop .....	52,599
Dnieper .....	68,000	Yeisk (12)...	51,750
Novocherkassk.	68,579	Alexandropol	
Kostroma .....	68,036	(11) .....	48,928
Cronstadt (11)	68,020	Arnavir .....	47,023
Taganrog .....	68,020	Batum .....	44,900
Tver .....	68,020		
Brast-Litovak.	68,020	<b>Siberia:</b>	
Grodno .....	68,020	Tomak .....	114,666
Perm .....	68,020	Irkutsk .....	98,400
		Vladivostok	
<b>Poland:</b>		(11) .....	91,464
Warsaw (15) ..	789,289	Krasnoyarsk ..	81,000
Lodz (10)...	415,604	Chita .....	77,800
Sosnowice (10)	98,748	Blagovyesh-	
Balute-Nowe	96,000	chenak .....	69,058
(10) .....	72,652	Novo-Nikola-	
Chenatochow	69,972	yevak (11)...	62,967
(10) .....	54,330		
Lublin .....	50,780	<b>Central Asia:</b>	
Kalis .....	49,623	Tashkent .....	271,900
Radom .....	44,700	Omsk .....	187,245
Bendin (10)...	38,982	Kokand (11)...	118,854
Piastrkow ...	38,982	Samarkand (10)	94,650
Pabianice (10)	38,982	Andishan (11)	82,235

The population is made up of Slavs, including Little and White Lithuanians, Poles, etc., 91.8 per cent; Letts and Lithuanians, 3.1; Mongols (the Kalmuks of the Astrakhan steppes), Tatars (in Southern Siberia), Kartvelians (14.5 per cent of the population in the Caucasus), Turko-Tatars (20.2 per cent of the population in the Caucasus), Cossacks (only in the Cossack provinces), etc. Jews in Russia totaled at the last census 5,070,205—3,715,081 in European Russia, 1,267,194 in Poland, 46,739 in the Caucasus, 32,648 in Siberia, 8543 in Central Asia. Urban population (1910), 22,506,800; rural, 141,272,000.

An attempt to calculate rather roughly the division of the 1914 population estimate into urban and rural, male and female, is shown below:

Births in European Russia, exclusive of Finland, numbered (1912) 5,238,186; deaths, 3,185,962—an increase of births over deaths of 2,052,224. Emigration in 1912 was as follows: 462,500 Russians and 422,200 foreign subjects—a total of 884,700 persons—left Russian territory; and 367,000 Russians and 472,400 foreigners—a total of 859,400 persons—entered the empire.

	<i>Urban</i>	<i>Rural</i>	<i>Male</i>	<i>Female</i>
European Russia .....	18,596,800	110,267,500	63,756,500	65,107,800
Poland .....	8,021,300	9,226,300	6,149,200	6,098,400
Caucasus .....	1,878,000	11,048,700	6,762,600	6,159,100
Siberia .....	1,193,600	8,807,100	5,146,100	4,854,600
Central Asia .....	1,607,900	9,495,600	5,925,900	5,177,600
	<b>26,297,600</b>	<b>148,840,200</b>	<b>87,740,800</b>	<b>87,897,500</b>

Some of the important towns in the great divisions are given in the next table, with their population in 1913 (Finland 1912), except where otherwise indicated in parentheses:

In 1913, 950,000 (529,000) Russians departed from Russia and 920,000 (404,000 Russians) entered. Emigrants to the United States in 1913 numbered 291,040; and in 1912, 162,395.

<b>European Russia:</b>	<i>Pop.</i>	<b>European Russia:</b>	<i>Pop.</i>
Petrograd (14) .....	2,133,100	Ivanovo-Voznesensk (10) ..	168,498
Moscow (15) ..	1,817,100	Astrakhan .....	162,482
Odessa (12)...	631,040	Samara .....	143,800
Kiev .....	626,313	Tula .....	139,700
Riga .....	558,000	Klshinev .....	128,200
Kharkov .....	249,698	Yaroslavl .....	119,167
Saratov .....	235,300	Minsk .....	116,700
Yekaterinoslav (12) .....	220,446	Nizhni-Novgorod .....	111,600
Rostov-on-Don	204,725	Dvinsk (10)...	110,912
Vilna .....	203,940	Vitevak .....	108,234
Kazan .....	194,246	Nikolayev .....	106,279

EDUCATION. According to the 1914 "Year Book of Russia," published by the Central Statistical Committee, the total schools of all kinds (A), total primary schools (B), and the total attendance at all schools (C) on Jan. 1, 1912, were as follows, exclusive of the cities of Petrograd, Kronstadt, and Baku, the governments of Warsaw and Tiflis, and the province of Kamchatka:

	<i>A</i>	<i>B</i>	<i>C</i>
European Russia.....	95,381	5,523,143	6,151,588
Poland .....	7,022	291,931	339,008

	A	B	C
Caucasia .....	2,685	165,410	177,877
Transcaucasia .....	2,548	127,657	145,081
Siberia .....	6,245	808,247	841,271
Central Asia .....	8,693	95,785	111,974
<b>Total .....</b>	<b>122,524</b>	<b>6,512,178</b>	<b>7,266,694</b>

To the total number of 7,266,694 students or pupils must be added: 206,961 pupils of private schools, lay or religious of Christian creeds; 958 pupils of schools for blind, and deaf and dumb; 329,585 pupils of religious schools of non-Christian creeds; and 233,911 not classed in the above categories. Total number of persons attending the schools of the empire (exclusive of Finland), 8,038,109.

**AGRICULTURE.** Much of the area of the empire is unfit for any kind of cultivation; the north is frozen during all but a few weeks, when pasture grass and berries grow; in the south, sandy steppes meet the head of the Caspian Sea, and dense forests occupy large tracts in the interior provinces and in Siberia. Between the Baltic and the Black seas, however, the soil is exceedingly fertile, producing great quantities of grain. Out of a total of 102,935,619 dessiatines (1 dessiatine = 2.7 acres) under private ownership, 26,812,251 belong to the peasants; 49,361,677 to the nobles; 16,093,974 to merchants, etc.; 154,689,573 to the crown, churches, etc.; 15,778,677 to corporations. Sixty-five per cent of the total forests of the empire is owned by the government (which derives an annual average revenue of 70,000,000 rubles from the timber industry), 23 per cent by landed proprietors, 9 per cent by the peasantry. The distribution of agricultural lands is shown below in acres (cereals, meadows, total with other of cultivated lands):

	Cereals	Meadows	Total
European Russia	196,997,000	61,830,000	209,789,000
Poland .....	11,877,000	2,280,000	14,078,000
Caucasus .....	22,078,000	5,676,000	22,612,000
Siberia .....	14,925,000	17,132,000	15,864,000
Central Asia .....	11,458,000	9,388,000	11,761,000
<b>Total * .....</b>	<b>256,830,000</b>	<b>95,756,000</b>	<b>278,599,000</b>

\* For 89 governments and provinces (Siberia, 8).

In another table is shown production of cereals, hay, and potatoes by great divisions of the empire, and the total for the 88 governments and provinces of the empire returning calculations, in thousands of poods, for 1912 and 1913:

	Cereals	Hay	Potatoes
European Russia	1912 3,798,984	2,889,250	1,538,188
	1913 4,262,606	2,091,502	1,452,116
Poland .....	1912 314,842	123,585	683,327
	1913 313,708	141,369	687,562
Caucasus .....	1912 859,850	168,873	39,218
	1913 536,328	168,694	32,800
Siberia .....	1912 267,728	620,255	48,697
	1913 823,629	558,211	57,424
Steppes .....	1912 200,749	405,040	9,388
	1913 200,384	291,362	11,389
Empire .....	1912 5,072,104	3,727,002	2,318,767
	1913 5,636,601	3,246,188	2,191,291

In 1913-14 there were reported 1,687,125 acres under cotton in central Asia and the Caucasus, producing 1,030,147 bales (500 pounds each); in 1914-15, 1,816,096 acres, 1,125,675 bales.

The statistics in the table next following cover 48 governments of Russia in Europe only, and show area in thousands of hectares and yield in thousands of quintals of important grain

crops (a = winter grain, b = spring grain), for two years, with the yield per hectare in 1915:

	1000 Hectares		1000 Quintals		Qa.
	1916	1915	1916	1915	
Wheat a.....	5,572	6,496	68,504	78,039	12.0
b.....	14,066	17,067	98,544	125,082	7.4
Rye a.....	23,459	24,450	212,438	225,144	9.2
b.....	178	283	1,116	1,770	7.6
Barley .....	10,160	11,378	96,818	108,530	9.4
Oats .....	14,363	14,427	126,276	131,782	9.1
Corn .....	1,484	1,585	18,286	19,951	12.6

According to the statistics issued by the All-Russian Sugar Refiners' Society the area under sugar beet in Russia in 1916 was 590,775 dessiatines, as compared with 660,796 dessiatines in 1915. The yield, it is estimated, was 644,246,000 poods (11,633,000 tons), as against 687,583,000 poods (12,415,000 tons) in 1915, the yield per dessiatine being 1090 poods, as compared with 1040 poods in 1915.

In view of the speculation concerning supplies held by belligerent countries, it may be of interest to compile a table of visible stocks of grain stored at ports, in interior mills and depots, and in railway elevators and warehouses on July 14th of the years indicated (in quintals); the second 1916 column is for May 14th:

	1916 (*)	1916 (‡)	1915 (†)	1914 (†)
Wheat ....	3,125,212	1,702,733	3,365,660	2,600,414
Rye .....	615,070	317,453	905,676	992,509
Oats .....	463,501	581,898	593,841	756,958
Barley ...	485,648	462,846	2,414,627	447,203
Corn .....	67,979	87,841	122,708	91,436
Flour .....	1,166,158	847,159	1,227,207	1,188,403

(\*) Berdiansk and Chistopol excluded. (†) Berdiansk excluded. (‡) Berdiansk and Tsaritayn excluded.

Live stock in the country (1914) by great divisions and total is given below (A = European Russia, B = Poland, C = Caucasus, D = Siberia, E = central Asia, T = Total):

	Horses	Cattle	Sheep, etc.	Pigs
A .....	22,529,000	32,704,000	87,240,000	11,581,000
B .....	1,098,000	2,014,000	565,000	452,000
C .....	2,092,000	5,779,000	12,555,000	1,849,000
D .....	4,840,000	6,541,000	5,745,000	1,428,000
E .....	4,414,000	5,014,000	16,168,000	185,000
<b>T. ...</b>	<b>34,978,000</b>	<b>52,052,000</b>	<b>72,278,000</b>	<b>14,995,000</b>

**THE FOOD PROBLEM.** In Russia generally, and in Petrograd more especially, the rise in the cost of living has attained an alarming altitude. Fish, instead of 30 kopeks a pound, now costs a ruble, 50 kopeks; butter, instead of 60 kopeks, is two rubles, 50 kopeks; meat from 27 kopeks has leaped to a ruble.

Information of the statistical section of the Moscow municipality furnished the ministry for foreign affairs affords a good idea of the course of this growth (prices quoted are for goods of various groups before the war and in July, 1916). The price of cereal products rose from 43 to 131 per cent. Millet rose 97 per cent., buckwheat 131 per cent. Dairy products exhibit even greater rises; almost all increased 100 per cent or more. For instance, cream butter 123 per cent, curds 125 per cent, cheese 180 per cent, Dutch cheese 344 per cent, etc. In the grocery group, such products as vermicelli, macaroni, yeast, show a rise of 50 per cent, sugar 57 per cent. Rice rose 150 per cent, coffee 150 per cent.

Vegetables and green groceries rose from 40 to 150 per cent. But all these increments are overshadowed by the increase of meat and meat products, in which smaller rises than 200 per cent are rarely encountered. For example, beef of prime quality costs 250 per cent more than before the war; of second quality, even 300 per cent; veal 234 per cent, mutton 281 per cent, pork 142 per cent, ham 150 per cent more. Sausages have risen two and three times in value. Thus meat is from two and a half to four times as expensive now as before the war. Similarly as regards poultry. Fish generally is twice and two and a half times as dear; herring are even four to five times.

The country has been interested in the proceedings of the so-called Alimentation or Food Congress, convoked in Petrograd for the purpose more especially of formulating a scheme for the establishment of firm prices on grain and other products. Incidentally, the vice-minister of agriculture, M. Glinka, furnished the meeting with some interesting data concerning the food campaign for the previous two years.

"During the first year," he said, "there were stocked more than 300,000,000 poods (4,800,000 tons) of various cereals, and during the second year more than 500,000,000 (8,000,000 tons), while it is purposed to stock 700,000,000 (11,200,000 tons) more; these figures testify to the magnitude of the task which rests upon the organization and the dimensions of the state undertaking which has been carried through till the present day. The value of the grain alone that has been stocked by the delegates exceeds a milliard (\$500,000,000), and it is proposed to expend yet another milliard. Yet, notwithstanding the size of these figures, they are for Russia, with her mighty agricultural husbandry and illimitable scope, far from considerable. We are entering upon the third year of the war, and are happy to be able to state that for the whole time our army has never run short of rations, and will not do so hereafter, even though the war should last an indefinite period. We have an enormous stock of grain. More than half a milliard poods (8,000,000 tons) of the old harvest still remain unexpended, and meanwhile there has begun the almost universal crop of new cereals, the supplies of which will be very considerable.

"When we set about the stocking of grain we met with an acute shortage of storage accommodation at stations where the grain could lie till shipment. This circumstance not only adversely affected the preservation of the grain, but rendered us unable to provide a constant reserve in which large supplies could be accumulated in good time. But during the past two years premises have been provided for fresh millions of poods of grain."

No lesser task is being carried out by the organization in furnishing the army with sugar. As stated by the Alimentation Conference, a series of measures have been adopted and all supplies of sugar at the sugar factories have been concentrated at the disposal of the government, which itself has prepared and cleared the way for further governmental measures in this sphere.

It is interesting to compare the rise in prices in Russia and Germany respectively. For this purpose the figures ruling in Moscow and Berlin have been taken as most representative:

Articles	Berlin Per cent	Moscow Per cent
Rye bread	42	48
Wheat bread	27	45
Rye flour	47	95
Wheat flour	14	58
Butter	114	128
Lard	300	178
Sugar	27	57
Coffee	183	180
Eggs	225	93
Milk	38	70
Beef	280	250
Mutton	180	288
Veal	170	234
Pork	114	142
Ham	188	144
Potatoes	58	44
Rice	427	150

**FORESTS.** Total area under crown forest in the empire, 349,094,692 dessiatines (105,338,965 in European Russia, 217,192,375 in Siberia); area worked by the government, 179,851,094 dessiatines. A table follows showing the revenue from state forests for June, for the first six months of 1916 in comparison with receipts for the corresponding periods of 1915, and 1916 increase; also for the year 1915 (in rubles):

	1916	1915	1916 +
June	5,525,744	4,879,026	646,718
Jan. 1-July 1	36,044,807	33,017,164	3,027,143
Jan. 1-Dec. 31		72,806,776	

**MINING AND METALS.** The empire is rich in minerals, quantities of which are found in the Obdorsk, the Ural, and the Altai mountains; but the industry is undeveloped. Capital is wanting, and the government does not encourage foreign enterprise. The great distances to be traversed and lack of transportation facilities militate against economical transportation of the requisite machinery. The table below gives the production for comparative years of the most important products of the mining and metallic industries in metric tons:

	1911	1913
Gold *	58,708	58,462
Platinum *	5,774	5,525
Silver *	15,512	18,018
Lead	1,238	1,699
Zinc	12,212	11,708
Copper	26,112	33,531
Pig iron	3,589,000	4,198,000
Iron and steel	2,887,000	3,727,000
Coal	28,414,000	30,910,000
Naphtha	9,152,000	9,260,000
Salt	2,013,000	1,906,000

\* In kilograms

In thousands of poods, by important centres of the metallic industries, is given production for comparative years below:

	Pig iron		Iron & steel, worked	
	1911	1913	1911	1913
So. Russia	147,747	178,379	112,748	128,062
Ural and Siberia	44,867	50,589	37,172	39,442
Cent. Russia	5,228	8,289	9,425	9,686
Volga			7,560	10,353
N. and Baltic	77	63	13,183	15,860
Poland	21,161	28,945	22,619	24,687
Total	219,075	256,265	202,702	227,540

Output of coal in 1914, 2,060,340 poods—1,713,100 in the south, 236,000 in Poland, 88,000 in the Ural region, 18,560 in Central Russia, 4080 in the Caucasus.

Output of petroleum in 1914, 530,000,000 poods (398,000,000 from the Baku district); 1915, 572,000,000 poods (Baku district, 446,000,000).

**MANUFACTURES.** The number of factories under state supervision Jan. 1, 1915, is given at 14,056, employing 1,960,860 persons. Distilleries 2406, output of alcohol 60,812,000 gallons; sugar works 237, output 106,110,000 poods; flax, jute, and hemp factories 414, value of annual output about 73,000,000 rubles; cotton spinning and weaving mills 140, value of annual production about 607,000,000 rubles.

Although the sale of alcohol in the form of drink has been abolished, the manufacture continues in perhaps larger amounts. Enormous quantities have been exported to France for use in the manufacture of high explosives.

In the figures of profits of liquor monopoly are included (a) debts recovered; (b) sums brought in after the winding up of big shops where the accounts were not simple; (c) sale of vodka in Russian central Asia and Transcaucasia (lately prohibited in both these districts also); (d) sale abroad; (e) the sale in government shops of Caucasian mineral waters, now very extensive.

Under the heading liquor excise is included the tax on mineral waters, grape juice, etc., tax on real wine in central Asia and Transcaucasia, on wine specially supplied for foreign consumption, on wines allotted to chemists for medical purposes, etc. The great increase in the returns is due to the tax on non-alcoholic drinks and government sales.

For the first time in the industrial history of Russia a platinum-refining factory has been operating since March, 1916, at Yekaterinburg. This factory has been constructed by a company of the Nikolo-Pavdinsk mining district, which in this manner has made a beginning in the task of liberating the Russian platinum industry from dependence on foreign markets.

American industrialists are taking measures for the organization of commercial relations with Russia. With this object a group of American mills and factories has established at Moscow an office to which is attached a museum containing samples of their products, including agricultural implements, machinery, rubber goods, paper, motor-cars, "notion" and trinket wares, foot-gear, leather, and rubber goods. A similar museum has been established at Chicago with a museum of Russian products and manufactures. Information about American and Russian goods respectively can be obtained at both these offices.

The degrees of activity of German and British undertakings in Russian industry may be compared by a reference to the amounts of capital involved. Out of a total capital of 3,964,126,000 rubles invested in industrial enterprises in 1914 native companies are represented by 3,376,780,000 rubles and foreign companies by 587,346,000 rubles. Of this latter, 156,581,000 rubles represent British capital and 67,969,000 German capital, which would not seem to give Germany a position of great industrial importance. As a matter of fact, however, it is claimed on the authority of the economist A. Bashmakov that fully one-fifteenth of the largest undertakings registered as native companies, and possessing a total capital of 110,575,000 rubles, are none other than German companies masked as Russian enterprises. The figures representing the total

German capital of companies established in Russia would, therefore, be at least 178,544,000 rubles—that is to say, more than 4 per cent of the total value (or 30 per cent of the total foreign capital).

While British capital is invested only in certain enterprises, such as mines and particularly in oil, the Germans are preëminent in the production of foodstuffs, electrical machinery, chemical products, timber, and in metallurgy. The influence of German capital in Russian industry is more far-reaching than that of British capital, for two essential reasons—first, because it is concerned with products absolutely indispensable to life; and second, because it is said to have secret forms of extension which mask the real measure of German penetration into Russian industry.

**FISHERIES.** The latest figures were for 1912: Total number of persons engaged, 296,200; yield in poods, 43,923,000; value in rubles, 97,155,000.

**COMMERCE.** The export of cereals, flour, and linseed, except to Allied countries, has been prohibited since Aug. 8, 1914. Exceptions may be authorized for exports to neutral countries. By Imperial ukase of March 10, 1915, the export of foodstuffs and of fodder has been prohibited except under special permit from the government in each case. By a decree dated May 17, 1915, the export of corn is permitted if destined for Allied countries.

In the table below is shown the trade for comparative years by the great avenues of distribution—A, by way of the European frontier; B, by the Black Sea (Caucasus) frontier; C, across the Asiatic frontier; D, to and from Finland; E, total across all frontiers; values in thousands of rubles:

Imports:	1912	1913	1914	1915
A	969,900	1,146,300	854,300	429,100
B	21,600	18,350	22,400	1,400
C	185,100	153,500	159,900	439,800
D	45,200	56,000	62,400	243,700
E	1,171,800	1,374,100	1,098,000	1,114,000
Exports:	1912	1913	1914	1915
A	1,267,800	1,232,800	706,100	181,800
B	110,600	132,900	104,300	.....
C	90,800	99,200	90,000	83,800
D	49,600	55,800	55,700	182,600
E	1,518,800	1,520,200	956,100	392,200

The statistics to follow relate to trade by way of the European and Black Sea (Caucasus) frontiers, and to and from Finland; trade by great classes is given in thousands of rubles:

Imports:	1913	1914	1915
Foodstuffs	163,002	120,872	75,578
Raw materials	622,495	471,992	297,840
Animals	3,105	2,412	870
Manufactures	431,987	848,823	800,850
Total	1,220,589	939,098	674,138
Exports:	1913	1914	1915
Foodstuffs	807,183	492,080	169,113
Raw materials	550,326	339,074	180,643
Animals	32,985	12,918	5
Manufactures	80,455	22,032	14,137
Total	1,420,949	866,104	313,888

The principal details of the cereal export are given as follows for 1914 and 1915:

	1000 Poods		1000 Rubles	
	1914	1915	1914	1915
Wheat	147,000	11,100	168,900	18,600
Rye	23,800	5,800	19,800	9,800
Barley	120,600	400	94,400	400
Oats	16,800	100	14,100	200
Corn	17,400	.....	12,600	100
Other	49,400	19,500	45,800	38,900
<b>Total</b>	<b>874,600</b>	<b>86,900</b>	<b>849,600</b>	<b>68,000</b>

The principal articles of import for consumption and of export of domestic produce follow, for comparative years, with values in thousands of rubles:

	1000 Rubles		
	1913	1914	1915
<b>Imports:</b>			
Cotton	100,098	88,506	42,700
Machinery	163,727	135,871	45,414
Tea	30,696	32,094	34,767
Wool	53,116	39,801	7,265
Metals	52,785	55,049	78,827
Rubber	42,280	29,968	82,241
Coal and coke	86,905	52,512	14,878
Metal mfrs.	18,158	11,172	9,094
Silk	27,258	19,744	11,948
Fish	35,044	28,821	6,710
Timber	49,873	33,639	17,195
Hides	57,092	41,177	44,485
Woolen yarn	18,950	18,505	1,222
Paper	40,609	34,172	47,418
Chemical prods.	59,415	46,558	54,119
<b>Exports:</b>			
Cereals and flour	589,939	349,739	67,993
Timber	163,620	104,420	27,290
Flax and tow	94,158	70,600	38,734
Eggs	90,639	58,495	14,809
Butter	71,160	48,339	62,236
Oil cake	38,527	22,570	4,421
Oil, seeds, etc.	34,496	19,405	2,750
Live animals	32,985	12,918	5
Petroleum, etc.	48,570	30,078	3,185
Furs, etc.	52,995	29,996	12,804
Hemp	22,845	12,888	5,080
Raw metals	16,427	6,627	12,782
Manganese ore	14,575	9,386	.....
Wool	1,721	1,718	1,790
Meat	9,302	5,076	1,316

The principal articles of export across the Asiatic frontier are sugar (21,310,000 rubles in 1915), and cotton goods (27,489,000); imports, rice (14,416,000) and raw cotton (59,003,000).

The next table gives imports and exports by great countries of origin and destination, in thousands of rubles for three years:

	1911			1914			1915		
<b>Imports:</b>									
Germany	476,839	417,797	23,698	476,839	417,797	23,698	476,839	417,797	23,698
United Kingdom	153,875	167,858	227,770	153,875	167,858	227,770	153,875	167,858	227,770
United States	100,813	77,018	151,021	100,813	77,018	151,021	100,813	77,018	151,021
France	56,170	42,929	28,795	56,170	42,929	28,795	56,170	42,929	28,795
Austria-Hungary	37,784	28,842	1,429	37,784	28,842	1,429	37,784	28,842	1,429
Finland	40,002	53,722	91,759	40,002	53,722	91,759	40,002	53,722	91,759
Netherlands	17,453	19,425	8,257	17,453	19,425	8,257	17,453	19,425	8,257
Rast Indies	24,414	24,476	7,479	24,414	24,476	7,479	24,414	24,476	7,479
<b>Exports:</b>									
Germany	490,189	248,805	.....	490,189	248,805	.....	490,189	248,805	.....
United Kingdom	336,740	188,462	150,458	336,740	188,462	150,458	336,740	188,462	150,458
Netherlands	188,849	94,696	2	188,849	94,696	2	188,849	94,696	2
France	90,807	55,636	16,580	90,807	55,636	16,580	90,807	55,636	16,580
Italy	52,708	40,575	188	52,708	40,575	188	52,708	40,575	188
Finland	53,665	55,730	132,630	53,665	55,730	132,630	53,665	55,730	132,630
Belgium	53,345	49,189	.....	53,345	49,189	.....	53,345	49,189	.....
Austria-Hungary	67,973	38,908	.....	67,973	38,908	.....	67,973	38,908	.....
Denmark	35,603	17,376	412	35,603	17,376	412	35,603	17,376	412

According to preliminary data, the value of exports and imports for January to July, 1916, 1915, and 1914 fluctuated as follows (A = by the

European, etc., frontiers, B = by the Asiatic frontier), in thousands of rubles:

	A.		B.	
	Imps.	Exps.	Imps.	Exps.
1916	212,423	589,787	57,448	481,811
1915	125,010	244,188	41,522	184,173
1914	800,914	782,847	56,758	115,318

By all frontiers of the empire exports for the aforesaid period in 1916 amounted to 269,871,000 rubles, in 1915 to 166,532,000 rubles, and in 1914 to 857,667,000 rubles; imports for same period in 1916 amounted to 1,071,598,000 rubles, in 1915 to 428,361,000 rubles, and in 1914 to 898,160,000 rubles.

From the preliminary data quoted above it will be seen that during the current year, with an increase of exports in comparison with 1915, by the European and Asiatic frontiers, of 103,339,000 rubles in all, or 62.1 per cent, imports increased by 643,037,000 rubles, or 150.2 per cent; the increase of imports over exports amounted to 801,727,000 rubles, against 261,829,000 rubles in 1915. Exports for the first half of 1916 proceeded chiefly to Great Britain (53,956,000 rubles); France (15,085,000 rubles); Rumania (4,083,000 rubles); Sweden (3,289,000 rubles); and Finland (87,400,000 rubles). The following exports, judged by value, were the most important—flax (41,792,000 rubles), wheat flour (18,219,000 rubles), sugar (9,291,000 rubles), hemp (7,907,000 rubles), deals (7,590,000 rubles); rye flour (6,791,000 rubles); skins of all kinds (4,039,000 rubles); undressed hides (3,935,000 rubles); raw cotton and cotton wool (3,397,000 rubles).

Imports from January to June, 1916, proceeded chiefly from Great Britain (111,070,000 rubles); the United States (100,921,000 rubles); France (51,232,000 rubles); Sweden (37,116,000 rubles); Japan (15,994,000 rubles); China (15,430,000 rubles); and Finland (94,202,000 rubles). (The foregoing figures do not include imports through Vladivostock, which are given below.) According to value, the following imports were most important—metal ware of various kinds (53,670,000 rubles), stationery (43,896,000 rubles), tea of all kinds (25,945,000 rubles), machinery of cast-iron, iron, and steel (24,981,000 rubles), iron and steel ware (17,682,000 rubles), copper in bars and scrap (17,244,000 rubles), wire and wire ware (16,366,000 rubles), leatherware (13,121,000 rubles), raw wool (10,592,000 rubles), rubber and guttapercha (10,563,000 rubles), motor-car platforms and chassis (10,286,000 rubles), lead in pig and scrap (9,318,000 rubles), silks and silk waste (9,250,000 rubles), four-seated motor-cars and over (8,754,000 rubles).

The total value of imports at Vladivostok for January to May, 1916, grew to 290,461,000 rubles, against 78,657,000 rubles in 1915, including imports from the United States for 165,246,000 rubles; from Japan for 70,710,000 rubles; from Great Britain for 37,642,000 rubles; and from China for 12,954,000 rubles.

SHIPPING. Vessels and tonnage entered and cleared in the total foreign trade of the empire for 1912 are shown in the 1915 YEAR BOOK.

COMMUNICATIONS. The expansion of railways from 1903 to 1912 inclusive, in English miles (E. R. = European Russia, A. R. = Asiatic Russia), was as follows:

Years	E. R.	A. R.	Total
1908	31,299	5,158	36,452
1904	31,735	6,372	38,107
1905	32,108	7,478	39,586
1906	32,743	8,005	40,748
1907	33,048	8,128	41,176
1908	34,108	10,472	44,580
1909	34,465	10,485	44,950
1910	34,581	10,497	45,078
1911	35,447	10,578	46,025
1912	35,937	10,586	46,523

An important development was the establishment of a new town and ice-free port about 6 degrees west of Archangel and saving a sea haul of about 700 miles. This port, known as Murman, comes within the sweep of the Gulf Stream and is the terminus of the Murman Railway, which, while projected before the war, was nearly completed in 1916, and formed the most northerly line in the world. In 1915 700 Canadian engineers were sent to Russia and construction work was rapidly prosecuted, notwithstanding the long polar nights. It is divided into four sections: Petrograd-Zwanka, 76 miles; Zwanka-Petrosavodsk, 171 miles; Petrosavodsk-Kem, 272 miles; Kem-Kandalascha, 215 miles; and Kandalascha-Murman, 177 miles. Of these, at the end of 1916, the Kem-Kandalascha was the only one that had not been completed. The new system was important for many reasons. It serves a valuable timber country embraced between Norway and the White Sea and bordering on the Arctic Ocean. The main points on the line are Murman, Kola, Alexandrovska, Kandalascha, Kanda, Kem, the west coast of Lake Onega, and Petrograd. The new line reduced considerably the rail haul from the Arctic terminal ports to Petrograd. Thus at Murman, 7 miles to the north of Kola, there were temporary wooden wharves for three large vessels with 25-ton cranes, and a harbor so large and roomy that over 40 vessels can anchor at the same time.

Another new project of the year was a railroad from Batum to Trebizond. The new railway, which was to be of the ordinary Russian 5-foot gauge, was planned, as far as possible, to skirt the foot of the mountains and follow the coast. Notwithstanding difficulties of construction the state engineers believed that they could finish the work in six months. It was not expected that the new line would be of much immediate value for general commerce.

Gross receipts (1914), 1,122,132,000 rubles (state lines, 772,486,000 rubles, company lines, 342,153,000; local lines, 7,493,000). For telegraphs, etc., see 1915 YEAR BOOK.

FINANCE. The monetary unit is the ruble (par value 51.456 cents), and the standard of value is gold. In the following table are shown revenue and expenditure in rubles; 1913 actual, 1915 and 1916 budget:

	1913	1915	1916
Rev. ord.	3,417,359,530	3,132,174,314	2,914,083,005
Rev. extra.	13,845,256	70,318,878	336,832,192
Total	3,431,204,786	3,308,561,986	3,250,915,197
	1913	1915	1916
Exp. ord.	3,094,248,094	3,174,124,091	3,068,055,297
Exp. extra.	288,665,314	134,497,695	76,791,106
Total	3,382,913,408	3,308,561,986	3,144,846,403

Partial details of the budget for 1916 are given in the table below in thousands of rubles:

Revenue:	1000 r.	Expenditure	1000 r.
Direct taxes	359,674	Public debt	580,323
Spirits	24,261	Council	9,098
Tobacco	149,594	Holy Synod	58,966
Sugar	180,858	Civil list	16,860
Naphtha	82,040	Foreign affairs	7,194
Matches	43,518	War	590,489
Customs	314,400	Marine	182,587
Railways	685,508	Finance	324,162
Domains	41,078	Commerce, etc.	63,515
Forests	75,891	Interior	324,162
Excise	49,860	Instruction	165,160
Duties	432,602	Communications	686,813
Posts	94,680	Agriculture	138,791
Tels. & tels.	70,600	Justice	101,786
Various		Audit	12,721
		State stud.	8,809
		Other	
Total ord.	2,914,083	Total ord.	3,068,055
Extraord.	336,832	Extraord.	76,791
Total	3,250,915	Total	3,144,856

By imperial command on August 29th (September 11th), by virtue of Article 87 of the Fundamental Laws, authority is granted to the State Bank, as a temporary war measure, to issue credit notes up to two milliards of rubles over and above the amount already authorized. Thus for the third time the emission right of the State Bank is expanded under Article 87. On the first occasion, it was expanded by imperial command of July 20 (Aug. 2), 1914, to the amount of 1,200,000,000 rubles; the second time on March 17 (30), 1915, to the amount of 1,000,000,000 rubles; and lastly, on Aug. 29 (Sept. 11), 1916, it was extended another 2,000,000,000 rubles. Only once was the expansion of the bank's note-issuing power effected with the direct approval of the legislative assemblies (Aug. 22-Sept. 4, 1915).

On Sept. 1 (14), 1916, the gold specie in the coffers of the State Bank amounted to 1,552,000,000 rubles. According to Russian law, credit notes issued above a certain norm must be secured ruble for ruble by gold; therefore, the total issue of credit notes may be raised, in accordance with the imperial command of August 29th (September 11th), to 7,052,000,000 rubles. As a matter of fact, by September 1st (14th) the issue had already reached 7,220,000,000 rubles (and by September 8th-21st—even 7,350,000,000 rubles), so that the percentage ratio of gold to this issue represented about 21.5 per cent. In addition to gold in specie, the note issue is further guaranteed by the so-called gold fund abroad, more correctly by various credits of which the Russian government disposes abroad. The fund on September 1st (14th) amounted to 2,055,000,000 rubles. Thus with the inclusion of the 5,500,000,000 rubles of all unsecured credit notes permitted the State Bank, it will be seen that the total amount of all credit notes may be brought up to 9,107,000,000 rubles, while if the foreign gold fund be taken into consideration, the gold guarantee for credit notes constitutes almost 40 per cent; although if we count as gold security only gold specie, the ratio declines to 17 per cent.

The note issue in Russia is the largest in the world. For instance, on September 1st (14th) the note issue of the Bank of France had reached 16,603,000,000 francs—i.e. 6,226,000,000



rubles; that of the German State Bank (on August 31st-September 13th) 7,117,000,000 marks—i.e. 3,295,000,000 rubles; that of the Bank of England (on September 1st-14th) only £36,100,000, or together with exchequer bills, £165,000,000—i.e. 1,500,000,000 rubles. And the gold guarantee of these note issues was considerably higher than the Russian. Thus in France it amounted to 25.6 per cent; in Germany to 34.7 per cent; and in England even to about 50 per cent (in Russia, as already stated, it is only 21 per cent). Concurrently with the foregoing the quotation of the ruble experienced much greater depreciation than that of the pound sterling, the franc, or even the mark, although in this depreciation other factors than the volume of note issues and its weak gold guarantee must be taken into account.

State expenditures are rapidly increasing. Ordinary expenditures for 1917 cannot be fixed at less than from 3,800,000,000 to 4,000,000,000 rubles, for 1918 at 5,200,000,000 rubles, and for 1919 at 5,700,000,000 rubles. It is imperative to discover constant and reliable sources to cover these growing outlays—the chief cause of which is the payment of war loans—more particularly when it is remembered that the state has abandoned the vodka revenue.

The ministry of finance has drafted, and partly carried into effect, a series of new indirect taxes of which we may note tax on textiles or yarn, tax on electric energy, tax on potato syrup, tax on grape wine. The old taxes the government continues to increase. The increase is proposed, and has already been partially effected, of the taxes on tea, petroleum products, and tobacco. The question of increasing the tax on sugar is being considered. The question of introducing state monopolies as a more perfect and productive means of indirect taxation stands alone. Tea, sugar, and match monopolies are first on the list. But in special circles the establishment of monopolies for wine, electric energy, and salt is seriously formulated. The question has been raised of compulsory syndicates—coal, petroleum, coffee, and rubber. The ministry of agriculture has of late been engaged in drafting a project for a monopoly of the grain trade, and the ministry of the interior an insurance monopoly project. There is serious talk about a drug and even a cinematograph monopoly. The nationalization of the railways and the timber business will come up for consideration after the war.

In 1916 in Great Britain the discount was effected of short-term (one year) bonds to the face value of £175,060,000, besides the sum of £114,340,000 discounted in 1915. Altogether in England there are at the present time bonds for £388,220,000. In France in 1916 the realization was effected of short-term bonds to the amount of 490,000,000 francs, besides 55,000,000 francs in 1915. Altogether there are in circulation in France bonds for 1,117,000,000 francs. According to the conditions of the agreement with the French government, the Russian government in proportion to its need receives three-months bills of the French exchequer which are discounted by the Bank of France out of the 5 per cents. In America in 1916 were issued short-term bonds for £11,000,000, and to replace those issued in 1915 for £10,200,000. Seeing that the bonds issued in America are paid on expiry of the term of their circulation, there is introduced

into the estimates an assignment of 534,435 rubles for payment of interest for the first half of 1917. In Japan the issue was effected of short-term bonds of the state exchequer for 50,000,000 yen of 5 per cents, with a term of one year.

The principal items of expenditure, according to the estimates of state credit for 1917, are the following—state debts in foreign currency unredeemable till Jan. 1 (14), 1917, amount to 50,958,198 rubles, interest on which, payable in 1918, amounts to 2,191,385 rubles. Debts redeemable on Jan. 1 (14), 1917, amount to 2,743,975,038 rubles. Interest payable thereon for 1917 is 104,557,864 rubles, and the amount payable on account of redemption of principal is 21,882,332 rubles. State debts effected in rubles equivalent to one-fifteenth of the imperial, unredeemable till Jan. 1 (14), 1917, remain at 3,265,472,285 rubles, and interest thereon for 1917 is 131,387,986 rubles. The redeemable debts are 8,480,569,482 rubles, interest on which for 1917 amounts to 430,738,335 rubles, and payment for redemption of principal 28,311,863 rubles.

The total national debt on Jan. 1 (14), 1917, is 14,540,272,995 rubles. Payment of interest on this amount is 668,875,570 rubles for 1917, and for redemption 50,194,695 rubles. Short-term exchequer bonds on Jan. 1 (14), 1917, are—in Russia, 6,500,000,000 rubles; abroad, 4,179,963,000 rubles. Interest payable on the latter for 1917 is 534,435,000 rubles. Thus the volume of debt outstanding on Jan. 1 (14), 1917, is equivalent to 25,220,963,895 rubles, interest on which amounts to 669,410,005 rubles, and payment for redemption 50,194,695 rubles. The total assignment for ordinary state debts and payment on account of interest and redemption is 719,604,700 rubles. Payments on redeemed debts are 60,000,000 rubles, bank provision 231,750 rubles; management expenses, 898,623 rubles; making total payment on account of state loans of 728,795,073 rubles. The total state debt on Jan. 1 (14), 1917, increased in comparison with the figures for Jan. 1 (14), 1916, by 6,344,206,084 rubles. See also BANKS AND BANKING; FINANCIAL REVIEW.

GOVERNMENT. Russia is a (nominally) constitutional monarchy under an autocratic czar, who is supreme ruler and legislator. The constitution of October, 1905, confers upon the people civic liberty based upon individual inviolability and freedom of conscience, speech, assembly, and association. The Council of Empire is composed of an equal number of elected members and members nominated by the Czar. The Duma (reduced to 442 members) has large powers of legislation, so long as none of the "fundamental laws of the imperial administration" are involved. The ruling senate, partly deliberative, and partly executive, is the high court of justice for the empire; the Holy Synod is the regulator of religious affairs; the Council of Ministers is composed of heads of departments.

The reigning Czar, Nicholas II Alexandrovich, of the house of Romanoff-Holstein-Gottorp, Emperor and Autocrat of all the Russias, was born at Petrograd May 18, 1868, and succeeded his father Nov. 1, 1894. He married (November, 1894) Princess Alix of Hesse; they have issue four daughters and a son, the heir-apparent, Alexis, born at Peterhof Aug. 12, 1904.

## HISTORY

**ECONOMIC CONDITIONS.** A sharp debate occurred on the occasion of the presentation of the budget toward the end of February. The deficit, after meeting both ordinary and extraordinary expenditures, was estimated at 355,000,000 rubles, and the war expenditures which were running at the rate of about 31,000,000 rubles a day threatened to reach a total at the close of 1916 of 11,000,000,000 rubles, as compared with 8,000,000,000 rubles in 1915. The budget, however, was finally accepted by the Duma and the Council of the Empire and it was approved by the Czar on April 24th. Among its features were an income tax applying to all incomes of 850 rubles and over; and a considerable increase of the educational appropriation. Down to the close of the year only a small portion of Russia's war debt had been funded. Large advances were made to her by Great Britain and France, and during the year two loans of \$50,000,000 each had been placed by her in the United States, on June 13th and November 3rd. Since the beginning of the war the balance of trade had been heavily against her. For the first six months of 1916, it was reported at over \$520,000,000. In the closing months of the year there were reports of a scarcity of the necessaries of life throughout a wide area of the country, owing largely to the interruption of the regular trade with Great Britain. Manufacturing in the interior cities had greatly declined. Additional restrictions on American trade were announced in December.

**THE STÜRMER MINISTRY.** Unsubstantiated rumors of a cabinet crisis and the resignation of Premier Goremykin at the close of 1915 were confirmed at length on Feb. 1, 1916, by his retirement on the ground of ill health, though it was supposed that it was in consequence of the criticism of his administration as inefficient and unsuccessful. He was succeeded by M. Boris Stürmer, who was, in the opinion of his critics, a reactionary and was, further, an object of suspicion on account of his German descent. Soon afterwards Comptroller-General Kharitanov resigned and was succeeded by M. Pokrovsky. The opening days of the administration were marked by the success of the Russian army in Asia Minor, where on February 16th they had captured the great Turkish stronghold, Erzerum. (See **WAR OF THE NATIONS.**) The session of the Duma was opened on February 22nd and the Czar attended it for the first time in person, a circumstance regarded as a step toward establishing closer relations between the throne and the representatives. The ministry soon found itself at odds with the Liberal element and with those who favored a vigorous prosecution of the war. The Liberal groups blamed it for failure to grant the necessary measures of political liberty and racial equality and for not according generous treatment to the Finns and Poles. Persecution of the Jews was alleged, and in a debate on that subject on March 24th, there was a scene of great disorder in the course of which the Conservative party left the hall. New changes in the ministry followed these attacks, and M. Khvostov resigned as Minister of the Interior. At about the same time the War Minister, M. Polivanov, resigned and was succeeded by General Shuvayev who had been Director of the Commissariat. The preceding

War Minister, General Soukhoulinov, had been blamed for failing to supply both munitions and strategic railways, and he was brought to trial on the charge of treasonable negligence after an investigation in March. He was afterwards imprisoned before the final sentence was rendered. Among the activities of the Duma may be mentioned efforts to promote railway extension and coöperative enterprise and to enforce economy. To the last-named end, measures were taken for enforcing temperance and for dispensing with meat for several days of the week. Also a law was passed prohibiting permanently the sale and consumption of vodka and wines were prohibited except those which had less than 12 per cent of alcohol. By an important measure passed on July 2nd the peasants, who since 1890 had not the right to vote for deputies to the Zemstvos but only to make a list of candidates from which the provisional governor made a choice, acquired the same civil rights as those possessed by other classes. The session of the Duma was suspended on July 3rd until November 14th. Later in July the Foreign Minister, M. Sazonoff, resigned on the ground of ill-health and the Premier, himself, temporarily succeeded him. At the same time, M. Khvostov resumed the control of the Interior and M. Makarov that of Justice. The resignation of M. Sazonoff was greatly deplored and by the Liberal element was believed to have been forced by M. Stürmer, and taken as another proof of his reactionary policy.

**CABINET CRISIS.** The meeting of the Duma on November 14th was soon followed by the overturn of the Stürmer ministry, against which many grievances had accumulated. Stürmer was charged with attempting to muzzle public opinion, with appointing extreme reactionaries to cabinet posts, with taking undue advantage of the government's privilege of enacting laws without the coöperation of the Duma, with enforcing obnoxious measures during the intermission of the session, and above all with endeavoring to repress altogether the popular organizations formed for raising funds and otherwise aiding in the prosecution of the war. These organizations, expressing at the same time a democratic tendency and a desire to support the government in the vigorous prosecution of the war, included such bodies as the All-Russian Zemetvo Union, the Union of Municipalities, and the War Industries Committee, which had contributed vast sums in aid of the military. The Stürmer ministry in April decided to forbid the meeting of such organizations, and in spite of the protests that followed, the government issued an order on October 4th placing all their meetings under the supervision of the police. This was interpreted by many as an effort to repress popular coöperation toward the winning of the war. The appointment as Minister of the Interior of M. Protopopoff, who was suspected of German leanings, also aroused much criticism.

These and other causes of complaint united all factions against the government. Finally on November 27th, the Ministers of War and Marine demanded united efforts toward the winning of victory, and in effect declared themselves on the side of the Duma. Meanwhile Stürmer resigned and on November 24th M. Alexander Trepoff, Minister of Ways and Communications, succeeded as Premier. On December 14th the appointment of M. Pokrovsky as Foreign Minister was announced. The year

closed with a stormy session of the Duma in which Professor Milukoff, leader of the Constitutional Democrats, assailed the government and was followed by several speakers who reported sensational instances of negligence in the prosecution of the war. The Duma passed a resolution referring to certain "dark forces" tending to undermine the nation's energies and cause disorganization in all departments. A like resolution was passed by the Imperial Council and the Council of Nobles. The critics of the government declared that a complete change was necessary in all departments. Another resolution of the Duma condemned the course of the authorities in prohibiting meetings of the Zemstvo, and declared that the Duma welcomed the patriotic work of these bodies engaged in national defense. The action of the Duma was received with great satisfaction by the organizations concerned and at the close of December Prince Lvov, President of the Union of the Zemstvos, and M. Tchelnokov, President of the Union of Municipalities, together with the representatives of many other social organizations, sent telegrams congratulating the Ministers of War and Marine on their patriotic speeches in the Duma. Messages of congratulation were also sent to the leaders in the Duma for their part in bringing about the change of attitude.

**OTHER EVENTS.** On January 2nd, the Czar, while reviewing the Knights of St. George, declared that the war would not cease until the soil had been cleared of invaders, and that Russia would not make a separate peace. On March 18th, it was reported that the Poutilov factories were sequestered on the ground that they had come under German control. Delegates from the Russian Duma paid a visit in May to Great Britain and France. The election of the Finnish Diet resulted in the following distribution of parties: Social Democrats, 103; Old Finns, 33; Young Finns, 22; Swedes, 21; Agrarians, 19. On May 8th representatives of the French government paid a visit to Russia. On May 25th the 25th anniversary of the alliance with France was celebrated. For the political convention with Japan signed on July 6th, see JAPAN, *History*. On September 23rd the Czar approved the plan for creating a ministry of public health. On November 21st, an explosion at Bakaritz, near Archangel, was reported to have killed 341 persons and injured nearly twice that number. See RASPUTIN, GREGORY.

**RUSSIAN BALLET.** See MUSIC, *Ballet*.

**RUSSIAN LITERATURE.** The war has made communication with Russia difficult and several months often pass before Russian books may reach this side of the Atlantic. To avoid undue delay the reviewer must therefore content himself with an incomplete record of the year's literary history. As a partial offset, however, reference will be made to a few titles omitted in the NEW INTERNATIONAL YEAR BOOK FOR 1915.

Russian poetry has remained pretty much what it was before the war.\* Among the best collections of verse which appeared this year may be mentioned those of Brinsev (1912-15), Ashukin (1913-15), S. Soloviev (1913-15), and Constantine Bolshakov (1915-16). The elegant Balmont, the original Gumilev, the genial Mandelstam have once more evinced their characteristic

mastery of form and expression. To these should be added the melancholy Parnok, the country-loving Sergius Esenin, the "symbolist" Kliuiev, and Viacheslav Ivanov who (in *Two Cities*) views man and his destiny from the heights of philosophical contemplation. Other typical representatives of modern Russian poetry are the "acmeist" M. Struve, the "egofuturist" Igor Sevérianin, Sergius Rafalovich, Rurik Ivirev, and V. Gorodets. Alexander Bloch has published an edition of Apollon Grigoreev and an interesting essay on the Magic of Poetry. Among poetic translations may be noted N. M. Galikovski's rendering of the *Servian Epic* of the Kosovo Cycle.

Theatrical history was uneventful in 1916 despite the appearance of Count Alexis Tolstói's comedy, *Impure Strength*, and of Dmitri Merezhkovski's *There Shall Be Joy*. The family drama of S. Shimanski, *Blood*, which creates an interesting type of a Russian businessman, and Vinichenko's psychological drama, *The Lie*, are not without merit. Leonid Andreev's *Youth* does not present real, live personages or dramatic situations. In this connection is worth noting I. I. Ignatov's *Theatre and Spectators*, a collection of essays describing the Russian stage of the first half of the nineteenth century; and Bloch's collection of his plays written between 1898 and 1904.

An important event was marked by publication by Vladimir Chertkov of Tolstói's *Diary*, the first volume of which embraces the years 1895-99. The second volume has not as yet left the press, but its contents may be gathered from A. Khiriakov's extracts published in the periodical *Létopis*. It covers the period from 1847 to 1853 when the great writer was struggling against "doubt and temptation." The *Memoirs* of the Decembrist Gorbachevski are not without historic interest. Here belongs also Gorki's *Among People*, which recounts the tribulations of young Aliesha Peshkov making his apprenticeship in life.

Russian *Intelligentsia* and the revolutionary movement have provided the theme of several novels: Grigoreev's *Lately*, as yet unfinished, A. P. Krandevskaia's *Joy's Secret*, a masterly portrayal of certain aspects of that movement, and Biely's *Petersburg*, a long drawn work, artificial in its conception and not free from mannerism in its composition. In *I Will!* Vinichenko modernizes the well-known figure of Oblomov. Another psychological novel is *Doctor Orlov* by G. Magnitski, who paints in bold strokes the figure of a man who succumbs to his passion. Alexis Tolstói's *Worldly Treasures* contrasts an old generation whose interests centre in material things with a new which looks on inward perfection as the goal of life. The sex problem which has hitherto loomed in the work of Artsybashev, Kuprin (whose *Pit* has appeared in volume form), Kuzmin, and Slezkin (*Olga Orga*) is represented by Anna Marr's *Woman on the Cross*. Artsybashev himself is the author of *The Slave*, a violent diatribe against the subjection of woman by man, devoid of literary merit.

Few Russian authors evince sympathy for war as such. Andreev's novel in diary form, *The Yoke of War*, expressly adopts the individualistic standpoint of the plain man for whom war is a calamity. Kurbatov's novel in war setting, *The Journalist*, has nothing to recommend

\* The attitude of the Russian proletarian poets toward the war is dealt with in an article by A. Kleinbort in the March issue of *Souremenny Mir*.

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it except its plot. There have appeared numerous volumes made up in whole or in part of war stories by Fedor Sologub, Vladislav Voinov, Skitalets (Petrov), N. Morozov, Boris Lazarevski, S. Auslender, Iuri Slezkin (*Holy Joy*, 1915), Prince Bebutova, and others. The best stories are, perhaps, Ivan Shmelev's *On the Highway* (1915), a masterpiece of realism in which, however, the war does not appear directly, but we are made to witness its echoes in the minds of the people left at home, and *His Choir Invisible*, a picture of war in its external, not its psychological, aspect. The number of stories which have war as a theme or a background is nevertheless relatively small. A list of the best among the others must include the *Provincial Stories* of Dobronravov, the *Forest Tales* of Kasatkin, the Tatar tales of Krasheninikov, *Children* and other stories of D. Aisman, the Viatka tales of D. K. Zelenin, the Siberian of Grevischikov, not to mention the new volumes of Kuprin, Verbitakiaia, Zaitsev (*Earthly Sorrows*), Andreev, and Al. Tolstoi (*Sparks*). Of single stories, Ivan Bunin's *Gentleman from San Francisco* (1915; available in English in the *Russian Review*), Trenev's *By the Quiet Water* (1915), Slezkin's *Deep Heart*, Surguchev's *Neighbor*, and Veresaev's *Grandfather* are gems of unsurpassed beauty.

The student of literary history will notice such works as Pypin's *Religious Movement Under Alexander I* and *History of Russian Freemasons*; Bogolubov's study of Novikov; and the third volume of *Russkie Propilei*, edited by M. Gershenzon, which deals with Turgenev, and must regret the death of the sociologist and historian Maxim Kovaleski.

Among new periodicals, the *Russian Memoirs* (Zapiski) takes the place of the defunct *Russkoe Bogatstvo*, and the *Siberian Memoirs* are worth noting as evidence of the literary awakening of Siberia.

Among the Russian authors who appeared in English translation may be mentioned S. Aksakov (*Years of Childhood*), Artsybashev (*War*), Andreev, Chekhov (*Plays and Stories*), Dauchenko, Garshin (*The Signal*, etc.), Goucharov (*Oblomov*), Fedor Sologub (*Little Demon, Old House*), Potapenko (*Forest*), and Veresaev (*Memoirs of a Physician*), and in addition numerous tales and poems.

**RUSSIAN SYMPHONY ORCHESTRA.** See **MUSIC. Orchestras.**

**RUTGERS COLLEGE.** A non-sectarian institution for the education of men at New Brunswick, N. J., founded in 1766. In the fall of 1916 the total enrollment of students was 1292. The faculty numbered 64. During the year Julius Nelson, professor of biology, and Rev. Charles E. Hart, professor emeritus of ethics, died, and Clarence Ward, associate professor of architecture, and Cullen W. Parmelee, professor of ceramics, accepted calls to other institutions. Following are the more important new appointments: Rev. Ferdinand S. Schenck, professor of ethics; A. R. Moore, professor of physiology; G. H. Brown, professor of ceramics; C. B. Lewis, M.D., college physician. The productive funds of the college amount to \$766,388, and in 1916 its income was \$298,153. The library contains 86,913 volumes and receives regularly over 2000 periodicals. On Oct. 12, 1916, Rutgers College celebrated with a pageant and other impressive ceremonies the 150th anniversary of its founding

in 1766 as Queen's College. At this time a campaign to raise a permanent endowment fund of \$1,000,000 was initiated, and up to the end of the year over \$250,000 had been received in pledges. In addition to this amount the benefactions of the year totaled some \$70,000. President, William Henry Steele Demarest.

**RYE.** The world's rye production in 1916 was only slightly less than that of 1915 and consequently large enough to meet the requirements for consumption. The production of the northern hemisphere for the year, according to estimates by the International Institute of Agriculture, Rome, was 1,868,579,700 bushels, a figure representing 98.8 per cent of the production of the preceding year and 106.9 per cent of the average for the five years 1909-13. In this estimate the five years' average is substituted for the yield in 1916 of a number of European countries not furnishing data under the conditions of war. The yields of Portugal, Serbia, Turkey in Europe and Asia, Mexico, and Algeria, roughly placed at about 27,500,000 bushels, in the absence of recent data are not included in the above estimate. The production for 1915-16 in the southern hemisphere was estimated at 2,255,000 bushels. The requirements of the northern hemisphere for the year are placed at 1,862,969,900 bushels and the available supply, including the remainders of the preceding crop in the northern and southern hemispheres at 1,977,552,220 bushels, leaving a surplus of 114,582,320 bushels. The world's yearly seed requirements included in the above figure are estimated to be about 247,000,000 bushels. There was practically no international trade in rye during the year. Maximum and requisition prices were fixed by law in Germany, Austria, and Hungary, and the exportation of rye was prohibited or else greatly restricted in practically all European countries.

The rye crop of 1916 in the United States, as estimated by the Department of Agriculture, was 47,383,000 bushels, produced on 3,096,000 acres at the rate of 15.3 bushels per acre. The corresponding figures for the preceding crop were 54,050,000 bushels, 3,129,000 acres, and 17.3 bushels. The average farm value on Dec. 1, 1916, was 122.1 cents per bushel and the total value of the crop on this basis was \$57,857,000, both figures being the highest on record. The average value per acre on Dec. 1, 1916, was \$18.60. The leading rye producing States and their yields were as follows: Wisconsin, 6,075,000; Minnesota, 5,025,000; North Dakota, 4,655,000; Michigan, 4,648,000; South Dakota, 4,500,000; Pennsylvania, 4,420,000, and Nebraska, 3,072,000 bushels. About 80 per cent of the acreage in rye was in the eastern half of the country. The Canadian rye crop of 1916 was about 84 per cent of normal.

**RYE, TOM C.** Re-elected Democratic Governor of Tennessee Nov. 7, 1916. See **TENNESSEE.**

**SACRAMENTO.** See **CITY PLANNING.**

**SAFETY AT SEA.** See **SHIPPING; UNITED STATES AND THE WAR.**

**ST. ALDWYN, MICHAEL EDWARD HICKS-BEACH,** first Earl. A British statesman, died at Fairford, Gloucestershire, April 30, 1916. Son of the eighth baronet named Hicks-Beach, whom he succeeded in 1854, Earl St. Aldwyn was born in 1837, and for most of his life was known by his family name. After an education at Eton and at Christ Church, Oxford, where he took the M.A., he entered politics and for 22 years he served continuously in Parliament, from 1864

to 1885 as Conservative member for East Gloucestershire and thereafter till his retirement in 1906 as member for West Bristol. After holding minor posts, he was appointed Chief Secretary for Ireland in 1874, and in 1878 Secretary for the Colonies, an office that he held for two years. From 1880 to 1885, during the administration of Gladstone, Hicks-Beach made violent attacks on Liberal policies, and it was a budget amendment proposed by him which brought about the defeat of the Gladstone government in 1885. For a short time thereafter he was leader of the House, was Chancellor of the Exchequer in 1885-86, and for a year returned to the office of Secretary for Ireland, after the Conservatives had defeated the Home Rule Bill. From 1888 to 1892, Sir Michael served as president of the Board of Trade, but he became best known during his second incumbency of the Chancellorship of the Exchequer (1895-1902), his administration being notable for economy. At this time his speeches on British foreign policy, especially in Egypt and China, attracted wide attention, and he it was who originated the expression "the open door in China." After his retirement from office he became a leader of the Conservative Free Traders, and in 1905, after giving up his seat in the House, he traveled to Japan. In 1906 he was created Viscount St. Aldwyn, and in 1915 Earl. His only son, Viscount Quenington, was killed in battle in France only a week before his father died.

**ST. CHRISTOPHER.** See **ST. KITTS AND NEVIS.**

**ST. HELENA.** A British island in the south Atlantic Ocean. Area, 47 square miles; population (1911), 3520. Capital, Jamestown (1439).

**ST. JOHN, JOHN PIERCE.** An American prohibition leader, died at Olathe, Kan., Aug. 31, 1916. He was born at Brookville, Ind., in 1833. During the Civil War he fought in the Union army, rising to the rank of lieutenant-colonel. Afterward, settling in Kansas, he was a member of the State Senate in 1872-73, and gained State-wide attention by a successful fight to bring about the defeat of United States Senator Samuel E. Pomeroy. Elected Governor of Kansas in 1879 and re-elected two years later, Mr. St. John used his influence to make the State "dry," and during the time that he held office a prohibition amendment to the constitution was passed by the Legislature. Thus far he had been identified with the Republican party; but in 1884 he accepted from the Prohibition party the nomination for the presidency. His change roused much bitterness. During the campaign he was burned in effigy hundreds of times and was twice shot at, but was uninjured. Many Republicans held that if St. John had supported Blaine, Cleveland would have been defeated. As it was, St. John polled 151,809 votes.

**ST. KITTS (or ST. CHRISTOPHER) AND NEVIS.** A presidency of the **LEEWARD ISLANDS** (q.v.).

**ST. LOUIS.** See **EDUCATION IN THE UNITED STATES.**

**ST. LUCIA.** One of the (British) Windward Islands colonies. Area 233 square miles, population (1911), 48,637. Capital, Castries (population given as 6266).

**SAINT-PIERRE AND MIQUELON.** A French island colony off the southeastern coast of Newfoundland, including some smaller islands.

The total area is 241 square kilometers (93 square miles), with a population of 6482.

**SAINT-SAËNS, CAMILLE.** See **MUSIC, France.**

**ST. THOMAS.** See **SÃO THOMÉ.**

**ST. VINCENT.** One of the (British) Windward Islands colonies. Area, between 140 and 150 square miles; population, 41,877. Capital, Kingstown (4300).

**SAKHALIN.** An island off the eastern coast of Siberia; divided by the 50th parallel into Russian Sakhalin, with 14,688 square miles and about 34,000 inhabitants, and the Japanese territory of Karafuto, with 13,155 square miles and about 50,000 inhabitants. Its fisheries are valuable and timber is abundant.

**SAKHAROV, VLADIMIR.** See **WAR OF THE NATIONS.**

**SALES OF ART OBJECTS.** See **PAINTING AND SCULPTURE.**

**SALIENT.** See **MILITARY PROGRESS.**

**SALONIKI.** See **WAR OF THE NATIONS.**

**SALVADOR.** The smallest of the American republics, situated on the Pacific coast of Central America and bounded by Guatemala and Honduras.

**AREA, POPULATION, ETC.** The area of Salvador has been calculated at 21,160 square kilometers (8170 square miles). According to another estimate, the area is 7225 square miles. The population as calculated for the end of 1915 was 1,267,762. Nearly two-thirds of the people are mestizos and nearly one-sixth Indians. Although the pure white element is small, Salvador has achieved a considerable degree of economic development and political stability. The average annual increase of population during the ten years ended 1915 is reported at 22,000. Marriages in 1914 and 1915 respectively: 4013 and 3886; births, 51,859 and 51,058; deaths, 25,413 and 37,447. The population of the capital, San Salvador, is estimated at 66,800 (or, with its rural districts, 75,000); Santa Ana, 48,000 (59,400); San Miguel, 25,000 (30,000).

Primary instruction is free and nominally compulsory. The total enrollment in public and private primary schools in 1913 was 50,560; in the following year children of school age (six to fourteen) were reported to number about 274,000. There are three normal, three technical, and a number of other schools of advanced rank, besides a national university.

**PRODUCTION, COMMERCE, ETC.** Agriculture is the principal occupation of the people. The chief crop is coffee. The area under coffee is about 211,000 acres; the 1916 crop was estimated at 750,000 quintals (of 101 pounds), as compared with 770,000 quintals in 1915. Other important products are bananas, cacao, sugar cane, rice, corn, tobacco, indigo, and balsam. There is some mining, especially of gold and silver.

In 1914, imports were valued at \$4,958,614 and exports at 26,991,237 pesos (silver). The chief imports are cotton goods, hardware, drugs and medicine, machinery, and flour. Coffee is represented by nearly four-fifths of the total export value. The coffee export in 1914 amounted to nearly 62,600,000 pounds, valued at 22,544,252 pesos; gold and silver ore, 1,905,334 pesos; gold bullion, 1,284,666; auriferous silver, 261,464; indigo, 247,152; sugar, 209,128; balsam, 206,799; cattle hides, 121,353. By countries, import values and export values (computed at

40 cents the peso) have been as follows, in thousands of dollars:

	Imports		Exports	
	1913	1914	1913	1914
United States .....	2,491	2,028	2,824	2,862
United Kingdom .....	1,604	1,284	706	596
Germany .....	714	485	1,700	2,614
France .....	418	298	2,030	1,560
Italy .....	225	234	1,208	1,088
Belgium .....	204	138	1	7
Aus.-Hungary .....	25	18	506	809
<b>Total, including others.</b>	<b>6,174</b>	<b>4,959</b>	<b>9,929</b>	<b>10,796</b>

It was announced during the year that the International Railways of Central America had projected a line to run southeasterly from Santa Maria to Santa Ana in Salvador. The completion of this and other lines in Central America, projected or under construction, would afford a direct through route between Vera Cruz, Mexico, and Panama and Colon, extending along the western portion of Central America through Guatemala, Salvador, Honduras, Nicaragua, and Costa Rica.

The length of railway in operation is reported at 425 kilometers (264 miles), all of narrow gauge. Telegraph offices, 215, with 3881 kilometers (2412 miles) of line. Post offices, 139.

**FINANCE.** The standard of value is silver. The silver peso was worth about 42.2 cents in 1913, 36.5 in 1914, and 35.4 in 1915. In 1914, revenue was 12,423,753 pesos, and expenditures 15,085,219 pesos. The larger receipts were: import duties, 6,076,770 pesos; export duties, 1,811,918; liquor excise, 2,747,271; stamps, 367,119. The larger disbursements in 1914: for the public debt, 3,773,596 pesos; war and marine, 3,310,021; interior, 2,355,393; fomento, 1,912,107; public instruction, 957,195; finance, 791,037. For the fiscal year 1916, estimated revenue and expenditure were 12,064,900 and 12,373,503 pesos respectively. The public debt, as reported for Dec. 31, 1915, was 27,560,288 pesos.

**GOVERNMENT.** The executive power is vested in a president, who, with a vice-president, is elected by direct vote for four years. The legislative power is exercised by a single chamber, the National Assembly, consisting of 42 deputies (3 for each of the 14 departments), elected annually by direct vote. The franchise is obligatory upon male citizens over 18 years of age. President in 1916, Carlos Meléndez, who was inaugurated March 1, 1915; Vice-President, Alfonso Quiñónez Molina. The President is assisted by a cabinet of four members, whom he appoints and who are responsible to the National Assembly. Each of the departments is administered by a governor, appointed by the President for four years.

**SALVATION ARMY.** There were in the United States and its possessions for the year ending Sept. 30, 1916, 967 corps and outposts, 3225 officers and cadets, 53,483 converts, 200,678 indoor meetings with an indoor attendance of 7,988,051; 154,728 open-air meetings with an open-air attendance of 18,362,992; 2423 life-saving scouts meetings with a life-saving scouts attendance of 34,478, and a company attendance of 1,310,039. In 1916, there were 4,250,568 copies of the *War Cry* published. There were 89 hotels and boarding houses, with accommodation for 6994; 1,875,642 beds supplied; 455,792 meals sup-

plied; 1254 indoor meetings with an attendance of 57,491. There were 121 industrial homes, which supplied 2,890,071 meals; 14 slum posts and nurseries; 25 rescue homes and maternity hospitals, 2169 girls admitted, 2137 girls passed out, 1,092,900 meals supplied, and 359,776 beds supplied. In the prison work there were 46,874 prisoners prayed with and advised, 3254 assisted on discharge, 283 situations found, and 11,601 converts. In 1915 there were 327,204 Christmas dinners, 888,335 persons afforded temporary relief outside of the Salvation Army industrial homes and hotels, 86,345 men for whom employment was found outside Salvation Army institutions, and 27,339 women for whom employment was found outside Salvation Army institutions.

There were in the world in December, 1915, 62 countries and colonies occupied, 41 languages in which Salvation was preached, 9635 corps and outposts, 1219 social institutions, 647 day schools, 19 military and naval homes, 17,288 officers and cadets (including social), 64,527 local officers, and 28,623 bandmen.

**SALVINI, TOMMASO.** An Italian actor, regarded by many as the greatest actor of modern times, died in Florence Jan. 1, 1916. He was born just 87 years before that date, in Milan. His father was a professor of literature at Livourne, and supervised his son's education. By the age of 14, Tommaso Salvini had given such promise of histrionic ability that the famous Gustavo Modena took him into his company and personally trained him. Before long he had become a member of the royal company at Naples, where he attracted the attention of the managers of Adelaide Ristori. This led to an engagement of several years, during which he took leading parts in support of the great Italian actress, who became his friend and champion. Afterward he spent some time in study, to prepare himself for a career in the highest realms of drama, and before again returning to the stage he participated in the Italian War of Independence, acquitting himself with distinction. In 1849 his performance of *Oedipus*, in an Italian version, at once placed him in the front rank of his profession, and this success was followed by a triumph in Alfieri's *Saul*, and by further notable achievements as *Egipto*, in Alfieri's *Merope*; Paolo, in *Francesca da Rimini*; Orasmane, in Voltaire's *Zaire*; Romeo, Hamlet, Ingomar, Samson, etc. In 1871 he visited South America and in 1873 England and the United States, being received everywhere with acclamation by the public, and by most critics. In New York he made a tremendous impression with his *Othello*, in which his tragic powers had the widest scope. His interpretation of the final scene, the murder of Desdemona, was so full of horror that it was condemned by some for brutality. "The popular verdict, however," says the critic of the New York *Evening Post*, "was that no such *Othello* had been seen before or was likely to be seen again. Most assuredly there has not yet been another comparable with it in tragic power. No player was ever richer in physical attributes. His stature was majestic, his voice wonderful in its range, sonority, and sweetness, his features were noble and extraordinarily mobile—not plastic, indeed, in the same sense as is the mask of Novelli—but instantaneously responsive to every change of emotion, and equally capable of illustrating the light play

of some passing fancy or giving the most vivid expression to the direct passions. His control of his resources was absolute, and in what seemed to be the wildest moments of emotional abandonment, his acting was ever free from the slightest suspicion of strain or rant. Moreover, he was supported by a company of the rarest excellence, headed by Signora Piamonti, herself a great actress worthy of her association, and scarcely dimmed by it. Nobody ever really saw Salvini act Othello except when Piamonti was his Desdemona."

Othello, then, was probably the most startling impersonation that Salvini ever achieved, but, unlike many actors of lesser genius, he was unwilling to allow his range to be narrowed by popular success in one department of the drama. In the opinion of the critic already quoted, Salvini's impersonation of the convict Conrad in *La Morte Civile* was his masterpiece, "the most delicate and subtle of all his impersonations and the one most completely independent of those physical gifts which lent a special glamour to all his heroic parts." In this play he compelled critical and popular admiration alike. Other tragic dramas in which he appeared in the United States were *King Lear*, *Macbeth*, *Hamlet* (in which he is said to have failed to appreciate the psychological subtlety that has been realized by the greatest interpreters of this part), *Saul*, *Samson*, and *Sauret's Gladiateur*.

Of his Saul, William Winter, in his *Shadows of the Stage*, says: "Salvini was grander and finer in King Saul than in any other embodiment that he presented. He seized the idea wholly, and he executed it with affluent power. He brought to the part every attribute necessary to its grandeur of form and its afflicting sympathy of spirit. His towering physique presented, with impressive accuracy, the Hebrew monarch, chosen of God, who was 'lifted a head and shoulders above the people.' His tremulous sensibility, his knowledge of suffering, his skill in depicting it, his great resources of voice, his vigor and fineness of action, his exceptional commingling of largeness and gentleness—all these attributes combined in that performance to give magnificent reality to one of the most sublime conceptions in literature. By his personation of Saul, Salvini added a new and an immortal figure to the stage pantheon of kings and heroes."

The most remarkable evidence of his many-sided genius was his ability to turn from tragedy of the most appalling sort to a comedy such as *David Garrick* or *Ingomar*, in both of which he had great success. The fact that his acting was done in Italian before an American audience, which yet seemed to lose nothing though the language was not understood, is a unique tribute to his power. In 1886 he and Booth played together in *Othello*, Booth playing Iago. Salvini at times also played Iago instead of the title rôle. He made several visits to the United States, and continued, afterward, to act in Italy, but his virtual retirement came in 1890. However, in 1902 he took part in the celebration of Ristori's eightieth birthday, and at the ceremonies following her death in 1906 delivered an oration. The Italian people had planned a celebration of Salvini's eightieth birthday, but the terrible earthquake at Messina, which directed all public efforts toward relief, interfered. In English was published *Leaves from the Autobiography of Tommaso Salvini* (1893).

**SALZBURG.** A crownland of Austria. The area is 2762 square miles; population in 1910, 214,737.

**SAMOA.** See GERMAN SAMOA.

**SAMOS.** An Anatolian island; a principality tributary to the Porte previous to November, 1912; covering an area of 468 square kilometers (181 square miles) and having a population of 53,424 in 1902, besides 15,000 natives of Samos residing on the Anatolian shore. The capital is Vathy, with about 8000 inhabitants. Upon the assassination of Kopassis Effendi in March, 1912, Turkey sent Begleris Bey to administer the country as prime-governor. In November, 1912, the island was occupied by Greek troops, and since that date has been administered by a Greek governor.

**SANDBURG, CARL.** See LITERATURE, ENGLISH AND AMERICAN, *Poetry*, American.

**SAN DIEGO EXPOSITION.** See EXPOSITIONS.

**SANDWICH ISLANDS.** See FALKLAND ISLANDS.

**SAN FRANCISCO.** See CITY PLANNING.

**SAN FRANCISCO EXPOSITION.** See EXPOSITIONS.

**SAN FRANCISCO SYMPHONY ORCHESTRA.** See MUSIC, *Orchestras*.

**SANGER, MARGARET.** See NATIONAL BIRTH CONTROL LEAGUE.

**SANITARY CONTROL OF WATERWAYS.** See SEWERAGE AND SEWAGE TREATMENT.

**SANITATION.** See GARBAGE AND REFUSE DISPOSAL; HYGIENE; PELLAGRA; PROSTITUTION; SEWERAGE AND SEWAGE TREATMENT; WATER WORKS AND WATER PURIFICATION.

**SANSKRIT.** See PHILOLOGY, MODERN.

**SANT, JAMES.** An English portrait, figure, and landscape painter, died in London, July 12, 1916. He lived to a great age, having been born at Croydon in 1820. A pupil of John Varley and of Sir Augustus Callcott, he also studied for four years in the Royal Academy schools. He was elected to the Royal Academy in 1870, and remained a member till his resignation in 1914. Queen Victoria chose him as her principal painter-in-ordinary in 1871; for her he painted many members of the royal family. In 1861 a collection of his work, made for the Countess Waldegrave, was exhibited at the French Gallery, and he was a frequent exhibitor at the Royal Gallery. Besides portraits and landscapes, he devoted himself to such subjects as: "Dick Whittington," "Little Red Riding Hood," "The Boy Shakespeare," "The Young Minstrel," and various pictures of religious trend, among which the most noted were "The Infant Samuel" and "The Soul's Awakening." It is said that till he was 95 he devoted several hours daily to professional work. In 1913 he was created C.V.O.

**SANTO DOMINGO.** The name of the capital of the Dominican Republic (q.v.), for which it is also sometimes used.

**SÃO THOMÉ AND PRINCÍPE.** A Portuguese island colony off the coast of French Equatorial Africa. The total area is 939 square kilometers (374 square miles) and the population was estimated in 1909 at 68,221. The colony is an important producer of cacao.

**SARAWAK.** A British protectorate covering about 42,000 square miles in the northwestern part of the island of Borneo, with an estimated population of 500,000. Capital, Kuching (25,000 inhabitants).

**SARGENT, JOHN SINGER.** See PAINTING AND SCULPTURE, *passim*.

**SARRAIL, MAURICE.** See WAR OF THE NATIONS.

**SASKATCHEWAN.** One of the Northwest Provinces of the Dominion of Canada, east of Alberta and west of Manitoba. The capital is Regina. Area, 251,700, of which 8318 water. Between 1901 and 1911 the population increased 439.48 per cent, or from 91,279 to 492,432; both the numerical increase and the increase per cent were greater than in any other Canadian province, and subsequent to the 1911 census the population continued to advance rapidly. The estimated population of Regina in 1915 was 50,000; Saskatoon, 25,000; Moosejaw, 24,000. These figures are far above the census returns of 1911, Regina having at that time 30,213 inhabitants; Moosejaw, 13,823; Saskatoon, 12,004; Prince Albert, 6254; Yorkton, 2309; Weyburn, 2210; North Battleford, 2105; Estevan, 1981; Swift Current, 1852. Of the population 10 years of age and over in 1911, males numbered 228,364 (62.11 per cent) and females 139,322 (37.89); of these, 195,247 males and 13,275 females were reported as employed in gainful occupations. Of the males employed, 67.3 per cent were in agriculture (the highest percentage for agriculture except in Prince Edward Island), 7.3 in building trades, 7.2 in transportation, and 7 in trade and merchandising; of the females, 53.6 per cent were in domestic and personal service, 18 professional, and 7.4 in trade and merchandising.

The provincial government is administered by a lieutenant-governor, appointed by the Governor-General of the Dominion; he acts through an executive council, or responsible ministry. The Legislative Assembly consists of one chamber of 54 members elected by direct vote for five years. In the 12th Parliament, which convened in 1911, Saskatchewan was represented by 4 Senators and 10 members of the House of Commons; the representation in the Commons on the basis of the 1911 census is 16. The Lieutenant-Governor in 1916 was Hon. R. D. Lake.

**SASLAVSKY QUARTET.** See MUSIC, *Chamber Music*.

**SATURN.** See ASTRONOMY.

**SAULT STE. MARIE CANALS.** See CANALS.

**SAVINGS BANKS.** There are two classes of commercial savings banks in the United States, mutual and stock. The former are found almost exclusively in New England and Eastern States, while the latter are found through the Middle West and the South. On June 30, 1916, according to the Comptroller of the Currency, there were 1864 mutual and stock savings banks, exclusive of the stock saving banks in the 10 States enumerated in the article STATE BANKS (q.v.). Their aggregate resources exceeded \$5,500,000,000 and they had more than 10,000,000 depositors. The mutual institutions numbered 622. They had resources amounting to \$4,548,000,000, including loans and discounts of \$2,221,000,000 and investments of \$1,999,000,000. Their deposits were \$4,187,000,000; and their combined surplus and undivided profits, \$354,680,000. There were 1242 stock savings banks with resources of \$1,033,000,000 and deposits of \$901,610,000.

**POSTAL SAVINGS BANKS.** The United States Postal Savings System was established in 1911. Any person at least 10 years of age may

open a postal savings account; no person may have more than one account; the accounts of married women are free from interference by their husbands; and post office employees may not disclose the amounts of deposits. By a special act of May 18, 1916, the amount that any person may deposit was raised from \$100 to \$1000, exclusive of accumulated interest; but a person may deposit as much as an additional \$1000 but will receive no interest on deposits above the first \$1000. Deposits bear interest at the rate of 2 per cent a year, interest beginning on the first day of the month following that in which a certificate is issued and becoming due one year later; no interest is paid for less than a full year. A depositor may exchange deposits for registered or coupon United States postal savings bonds, bearing interest at 2½ per cent, in denominations of \$20, \$100, and \$500. The act of May 18th also provided that postal savings funds may be deposited by the postal authorities in qualified banks, national or State, whether members of the Federal Reserve system or not; the Federal Reserve Act had required such deposits to be made in member banks only. Such deposits bear interest of not less than 2¼ per cent; but 5 per cent of the postal savings funds must be kept with the Treasurer of the United States as a reserve. The funds received in any community must be given to member banks of the reserve system. If no local bank is qualified then the funds must be deposited in the bank most convenient to that locality. The original act authorized the trustees to invest not more than 30 per cent of the postal savings deposits in bonds or other securities of the United States; the act of May 18th annulled this and provided that if the deposits in any State exceed the amount which qualified banks therein are willing to receive, and if the 5 per cent reserve fund is fully paid in, all or any part of this excess may be invested in postal or other securities of the United States.

In the fiscal year ending June 30, 1916, there were 8421 depositories in operation. Deposits increased during the fiscal year from \$65,684,000 to \$86,019,000, or 31 per cent, and at the close of 1916 were increasing about \$1,000,000 per week. The number of depositors increased from 525,000 to 602,937, or 14.8 per cent. States showing more than \$1,000,000 of deposits, with the number of their depositors on June 30, 1916, were as follows: California, 24,224, \$3,835,000; Colorado, 9917, \$1,652,000; Connecticut, 15,067, \$1,933,000; Illinois, 35,979, \$5,991,000; Indiana, 9351, \$1,377,000; Massachusetts, 31,558, \$3,995,000; Michigan, 19,455, \$3,200,000; Minnesota, 11,852, \$1,951,000; Missouri, 14,177, \$2,136,000; Montana, 6389, \$1,306,000; New Jersey, 22,762, \$2,806,000; New York, 211,007, \$27,607,000; Ohio, 34,834, \$5,476,000; Oregon, 10,472, \$1,557,000; Pennsylvania, 45,579, \$7,107,000; Washington, 12,963, \$2,119,000; and Wisconsin, 10,843, \$1,811,000. By December 1st the total number of depositors had increased to 660,000 and deposits to \$108,500,000. There were 5634 banks qualified to receive postal deposits. The amount of postal savings bonds issued to depositors during the year was \$1,694,280 in registered form and \$150,420 in coupon bonds; these made the total then outstanding \$9,151,800. In addition the postal savings trustees purchased \$604,460 of such bonds during the year, making their total



holdings \$1,558,500. That the system is self-supporting is shown by the fact that there was paid into the treasury of the United States during the fiscal year 1916 \$2,132,912. During the year the system was extended to eight post offices in Alaska. Moreover, a special effort was made to reach the foreign-born population of the country by the issue of circulars in the mother tongues of about 95 per cent of this population.

**SAXONY.** A European kingdom, one of the more important constituent states of the German Empire. The capital is Dresden. Also, a province of Prussia. See GERMANY, *Area and Population*.

**SBARRETTI, DONATUS, CARDINAL.** See ROMAN CATHOLIC CHURCH.

**SBRIGLIA, GIOVANNI.** An Italian opera singer and teacher, died in Paris Feb 20, 1916. He was born in Naples in 1840, studied there at the Conservatory, at 21 made his début, and afterward for some years took tenor rôles in opera, not only in Italy, but also in Paris and in the United States, where he sang with Adelina Patti. Later he established himself in Paris as a teacher of singing. Among pupils of his who became famous were Nordica, Plançon, and Edouard and Jean de Reszke.

**SCABIES IN CATTLE AND SHEEP.** See VETERINARY MEDICINE.

**SCANDINAVIAN LITERATURE.** One of the noteworthy features in the Scandinavian literature of this year is the keen interest in the war. The battle field has been a favorite scene for stories; the political aspects of the war and the question whether, in general, war is defensible have been dealt with frequently both in books and in periodical literature.

**DANISH. Drama.**—Einar Christiansen's *Møders Venner (Mother's Friends)* was well received. Its chief merit, however, was in the fidelity of its local color. In *Viljen (Will)* Olga Off aims to represent the will as the important factor in life. Carl Gan's *Lazarus*, a one act comedy, pictures the unsuccessful attempt of a poor author to borrow some money from an old friend and schoolmate who has become prosperous.

**Fiction.** Jeppe Aakjær's *Hjørter der er gørende Kræfter (Where There Are Seething Powers)* shows the saving influence of woman in directing the "seething powers" of man away from the lower toward the higher aims of life. The thesis of Henrik Pontoppidan's *Enslens Død (Enslens Death)*, the fourth story of the series beginning with *Torben and Jytte*, is that each generation must gain its liberties anew. Jakob Knudsen's *Den Gang (That Time)* is realistic and convincing. Of late years several of the younger Icelandic authors have written their books in Danish instead of their mother tongue. One of these is Gunnar Gunnarson, whose book *Smaa Historier (Little Stories)* is teeming with Icelandic life and atmosphere. A notable event was the completion of the English translation (by Jessie Muir) of Martin Nexö's great work *Pelle the Conqueror*. The fourth and last volume is entitled *Daybreak*.

**Miscellany.** Owing to the nearness of Denmark to the battle fields, the interest in the war in that country is more acute than in Sweden or Norway, a fact which is reflected in its literature. Two works on the war deserve special notice. In *Verdenskrigen (The World War)* Georg Brandes arraigns the entire system of Eu-

ropean politics and diplomacy. His treatment of the conflict is not that of the indifferent spectator, but rather of the impartial judge. The other work is Vald. Ammundsen's *Krig og Krigsførende Kristne (War and War-Waging Christians)*.

**NORWEGIAN. Drama.** Johan Bojer's *Sigurd Braa* is the story of a man who is encouraged by his dying wife in his resolve to go to prison for the sake of the men working under him. It is partly a social drama, partly a eulogy on the power of love.

**Poetry.** Norwegian poetry has retained the old Danish characteristics much more persistently than Norwegian prose. Vocabulary and forms are Norwegian, but the rhythm is nearly always Danish, and in general we may notice Danish influence, or other foreign influence coming through the Danish. An attempt to approach more closely to the living Norwegian language is made by Alf Larsen in his book *Indgangen (The Entrance)*, which includes the collection *Vinterlandet (The Winter Country)* published two years before under the pseudonym Ingebrekt. The theme running through all of the poems is life's lack of meaning. Einar Solstad made his début with his *Digte (Poems)*, which prove him a poet of nature. In his descriptions of flowers Solstad is surpassed only by Olaf Bull. In Arnulf Overland's *Advent*, the most powerful poem is "Norge" ("Norway"). Kristofer Uppdal's *Snörim (Snow Verses)* deserve particular praise for getting away from the Danish character usually found in Landsmaal poetry.

**Fiction.** In Gabriel Scott's *Jernbyrden (The Iron Burden)* we read the story of a man who moves into a strange place, is looked upon at first as a danger to the community, but later receives the unlimited confidence of the people. Barbra Ring's *För Kulden kommer (Before It Gets Cold)* surpasses the author's previous works. It depicts the life of a woman from her early and ill-advised marriage through her subsequent downward career to her decision to commit suicide. Kristian Elster's *Ilden (The Fire)* shows an advance in form. The fire from which the book takes its name profoundly influences the character and destiny of the two children whose father it ruined. Knut Hamsun's *Segelfoss by (The Village of Segelfoss)* is a sequel of last year's *Children of the Times*. In *Fabler og hændelser (Fables and Events)* Trygve Andersen gives a very faithful and well-rounded picture of Norwegian life of former times.

**Science, Literature, etc.** Gerhard Gran's *Norsk aandsliv i hundrede aar (A Century of Norwegian Culture)* shows the author's power to distinguish the large essentials and to make them stand out clearly. Hans E. Kinck's *Historien om Niccolò Machiavelli (The Story of Niccolò Machiavelli)* shows an unusual understanding of the nature and thought of the Italian people. Arnold Ræstad's *Krigs og fredsproblemer (Problems of War and Peace)* is a very practical work. The author realizes that the problems of war and peace are intricate and complex as life itself.

**Swedish. Poetry.** Verner von Heidenstam (q.v.), who in 1916 was awarded the Nobel prize for literature, issued *Nya dikter (New Poems)*. The volume includes some of Heidenstam's earlier poetry. Throughout the book the idealistic tendency characteristic of the author is revealed, and several of the poems remind one of Viktor Ryd-

berg. In Gustaf Ullman's *Ur livets visor (From the Songs of Life)* we see an underlying faith in life gleaming through the soft melancholy which permeates the poems. Matts Magni Granström's *Hat och kärlek (Hate and Love)* shows the influence of Runeberg. Here, as usually in his poetry, Granström touches on the relation between the outer and the inner, the objective and the subjective. Other productions worthy of mention are Bertil Malmberg's *Atlantis* and Pär Lagerkvist's *Angest (Dread)*.

**Fiction.** The characters in Henning Berger's *Gulaochbaronerna (The Nouveaux Riches)* are inhabitants of Copenhagen who through war speculations have risen from poverty to immense wealth. In *Eldens återaken (The Reflection of the Fire)* Sigfrid Siwertz shows the varied effects of the war on a group of his countrymen. In Gustaf Hellström's new novel, *Bengt Blanck's sentimentala resa (Bengt Blanc's Sentimental Journey)* one of the problems touched on is the influence of a woman's false step on her later life. Elin Wägner's *Släkten Jerneploogs framgång (The Success of the Jerneploog Family)* is a portrayal of political and social conflicts, seen through the eyes of a woman. To his series of parsonage stories K. G. Ossian-Nilsson added *Prästens barn (The Pastor's Children)*. Among collections of short stories may be mentioned Hanna Söderlund-Hammar's *Lyckta dörrar (Locked Doors)*, depicting contemporary peasant life, and Karl Ostman's *Hunger (Hunger)*, portraying the life of the workers in the sawing mills of Northern Sweden. In 1916 Selma Lagerlöf's *The Emperor of Portugallia* appeared in an English translation by Velma Swanston Howard.

**Science, Literature, etc.** Fredrik Lagerroth's *Frihetstidens författning (The Constitution of the Period of Freedom)* is a study in the history of the Swedish constitution. Svante Arrhenius added to his books on astronomy *Stjärnornas öden (The Destinies of the Stars)*, in which he advances some new theories. Henrik Schück's *Shakespeare och hans tid (Shakespeare and His Time)* is an important contribution to Shakespeare criticism.

**SCANDINAVIAN PHILOLOGY.** See PHIL-  
OLOGY, MODERN.

**SCANNELL, RICHARD.** An American Roman Catholic bishop, died in Omaha, Neb., Jan. 8, 1916. He was born in County Cork, Ireland, in 1845, and after a college education at Midleton, Cork, and theological training at All Hallows College, he was ordained priest in 1871. Upon coming to the United States, he was given a pastorate in East Nashville, and from 1880 to 1883 was rector of Nashville Cathedral and administrator of the diocese. In 1887 he was consecrated first bishop of Concordia, Kan., and in 1891 was transferred to Omaha.

**SCENIC HIGHWAYS.** See ROADS AND  
PAVEMENTS.

**SCHMITZ, BRUNO.** A German architect, died in Berlin April 27, 1916. Born in 1858 at Düsseldorf, where he studied in the Academy, he lived, from the age of 28, for the most part in Berlin. In 1906 he was appointed professor by the Technical School at Dresden, and the same institution gave him an honorary degree of doctor of engineering in 1905. As early as 1881 he won first prize in the competition for the Victor Emmanuel monument to be erected in Rome, and for the national monument to Kaiser William I,

for Berlin. He became best known for the great "Battle of the Nations" monument at Leipzig, but many other monuments, as well as buildings, were erected from his designs in various parts of Germany and elsewhere. Among these were: a music hall in Zurich, the Kaiserin Auguste monument at Coblenz, the rose garden and Friedrichplatz at Mannheim, and, in the United States, the Soldiers' and Sailors' monument in Indianapolis and the German pavilion at the St. Louis Exposition. At the time of his death he was regarded as one of the leaders, probably the most distinguished, of his profession in Germany.

**SCHNITZLER, ARTHUR.** See GERMAN LIT-  
ERATURE, *Miscellaneous*.

**SCHOLA CANTORUM.** See MUSIC, *Choral Societies*.

**SCHOLEM ALEICHEM.** See ALEICHEM.  
**SCHÖNHEBER, KARL.** See GERMAN LIT-  
ERATURE, *Drama and Miscellaneous*.

**SCHOOL ADMINISTRATION.** See EDUCA-  
TION IN THE UNITED STATES.

**SCHOOL BUILDINGS.** See ARCHITECTURE.

**SCHULTHESS, EDMUND.** See SWITZERLAND.

**SCIENTIFIC CONGRESS, PAN-AMERICAN.**  
See PAN-AMERICAN SCIENTIFIC CONGRESS.

**SCOTLAND.** See GREAT BRITAIN.

**SCOTT, ROBERT FALCON.** See LITERATURE,  
ENGLISH AND AMERICAN, *Travel*, American.

**SCOTT-MONCRIEFF, SIR COLIN CAMPBELL.** A British engineer, died in London April 6, 1916. He was born in Scotland in 1836, and after training at the Military College, Addiscombe, went to India in 1856 as second lieutenant in the Bengal Engineers. He gained a reputation for achievement in the irrigation department of the Northwest Provinces, and as chief engineer of Burmah, before retiring from the Indian service in 1883 with the rank of colonel. In the latter year he went to Egypt to take charge of the irrigation department; there he spent nine years, as under-secretary in the public works department at Cairo, and during this period supervised a great undertaking—the restoration of the Nile Barrage, which was to make possible the irrigation of the country. In 1892, having been made K.C.M.G. several years before for his services, he returned to London, and became Under Secretary for Scotland. This post he held till 1902. From 1901 to 1903 Scott-Moncrieff was president of the Indian Irrigation Commission; at the end of this time he was made K.C.S.I. Edinburgh gave him the degree of LL.D. His one book was *Irrigation in Southern Europe*, published in 1868.

**SCULPTURE.** See PAINTING AND SCUL-  
PTURE.

**SEABURY, WILLIAM JONES.** An American Protestant Episcopal clergyman and theologian, died at East Hampton, L. I., Aug. 30, 1916. His father, grandfather, great-grandfather, and great-great-grandfather were all clergymen, among them being Bishop Samuel Seabury, the first Episcopal bishop in America. He was born in 1837 in New York, graduated from Columbia in 1856, and two years later was admitted to the bar. He did not practice long, however, but entered the General Theological Seminary, graduating in 1866. Two years later he succeeded his father as rector of the Church of the Annunciation in New York and there he remained for 30 years. During most of this time, from 1873, he also served as professor of ecclesiastical

polity and law in the General Theological Seminary. This post he retained till his death. Dr. Seabury received doctor's degrees from Hobart College and the General Theological Seminary. He was the author of *Notes on the Constitution of 1901* (of his Church) (1902) and *Memoir of Bishop Seabury* (1908).

**SEALS.** See ALASKA.

**SEARCH LIGHT.** See ELECTRIC LIGHTING.

**SEARS, LORENZO.** An American English scholar, died in Providence, R. I., Feb. 29, 1916. He was born at Searsville, Mass., in 1838, and after graduating from Yale (1861) and from the General Theological Seminary (1864), he took orders and was a rector in New England till 1885. From that year to 1888 he was at the University of Vermont as professor of rhetoric and English literature. In 1890-95 he held the chair of rhetoric at Brown, and thereafter till 1906 that of American literature. Professor Sears published, among other works: *The History of Oratory* (1896); *The Occasional Address* (1897); *American Literature in the Colonial and National Periods* (1902); *The Makers of American Literature* (1904); *Wendell Phillips* (1909); *John Hancock* (1912); *John Hay* (1914).

**SEGUR, PIERRE MARIE MAURICE HENRI, MARQUIS DE.** A French historian, died at his château near Poissy, Aug. 13, 1916. He was born at Paris in 1853, was educated at the College of Stanislas in that city, and entered the public service in 1876 as auditor to the privy council. He soon renounced an administrative career and devoted himself to French history and literature. His works were several times honored by the French Academy, of which he was made a member in 1907. He wrote: *Le Maréchal de Ségur* (1895), a tribute to an ancestor; *Le Royaume de la rue Saint-Honoré* (1897), *La Dernière des Condé* (1899), and *Julie de Lespinaasse* (1905), three volumes on French society in the eighteenth century; *La Jeunesse du Maréchal de Luxembourg* (1900), *Le Maréchal de Luxembourg et le Prince d'Orange* (1902), and *Le Tapisserie de Notre-Dame* (1903), three studies of the seventeenth century. *Louis XVI et Turgot* (1910) and *Louis XVI et Necker* (1913) are histories of the early part of the reign of Louis XVI. De Ségur also published several volumes containing articles and discourses, including *Gens d'autrefois* (1903); *Esquisses et Récits* (1908); *Silhouettes historiques* (1911); and *Parmi les cyprès et les lauriers* (1912).

**SEISMOLOGY.** See EARTHQUAKES.

**SELANGOR.** A state of the Federated Malay States (q.v.).

**SELECTION.** See ZOÖLOGY, *Selection*.

**SELIGMAN, JAMES.** An American banker, died Aug. 26, 1916, at his summer home in Long Branch, N. J. One of eight brothers, all of whom eventually became bankers, he was born in 1824 at Baidersdorf, Germany. As a young boy he learned the weaver's trade, and at 15 he was sent out with a brother to try his fortune in America. They joined another brother in Pennsylvania, and James was successively a carpenter, peddler of jewelry, and peddler of drygoods. The brothers opened drygoods stores in the South and later in St. Louis, Watertown, N. Y., and New York City. During the Civil War they received contracts from the government to supply uniforms, and this gave them

their first big success. Afterward the brothers became bankers, under the name of J. and W. Seligman and Company, and several of them left New York to open branches in London, Paris, Frankfort, and San Francisco. James Seligman remained identified with the New York house, of which he was senior member. At the time of his death he was the oldest member of the New York Stock Exchange, which he joined in 1869, after holding membership in the old Gold Board. For 15 years he served on the governing committee of the exchange. He was also one of the founders of the most noted New York synagogue, the Temple Emanu-El, and for many years was president of the congregation.

**SEMBRICH, MARCELLA.** See MUSIC, *Artists, Vocalists*.

**SENEGAL.** One of the colonies composing the government-general of French West Africa (q.v.).

**SERBIA.** One of the Balkan states; a constitutional European monarchy, hereditary in the male line of the house of Karageorgevich. Until 1878 an autonomous Turkish dependency. Capital, Belgrade. Serbia was a member of the alliance against Germany and lost her entity in the struggle.

**AREA AND POPULATION.** By the terms of the treaty of Buchareat, Serbia gained as the result of the wars in the Balkans the eastern part of Novibazar, Kossovo, and Central Macedonia. The area of the country is given as 48,303 square kilometers (18,650 square miles), and the population (census of Dec. 31, 1910), as 2,911,701. Total area with conquered territory, 33,891 square miles, 4,547,992 inhabitants.

Marriages, 1912, 13,289 (30,453 in 1911); births, 114,257 (107,229); deaths, 63,358 (64,415). Population of Belgrade (1910), 89,876; Nish, 24,949; Kraguyevats, 18,386; Lescovats, 14,266; Pozharevats, 13,613; Shabats, 11,541; Pirot, 10,737; Vranja, 10,487. In the new territories are Bitolj (Monastir), 59,856; Usküb, 47,384; Prilip (Perlepe), 21,783; Prizren, 21,244; Prishtina, 18,174; Veliz, 15,624; Novibazar, 13,434; Debar, 10,199; Tetovo, 10,070.

**PRODUCTION.** Agriculture is practically the only industry. Before the German invasion nearly every peasant occupied and cultivated his own freehold, varying from 10 to 30 acres, and enjoyed immunity from dire necessity. Alms-house and pauperism were almost unknown. The country is rugged and broken by stretches of uncultivated heath. About 130,000 acres are devoted to plum orchards, the fruit being preserved in large quantities for export, as well as distilled for spirits. It is reported that in 1911, 954,571 acres were sown to wheat; 254,593 to barley; 258,789 to oats; 123,218 to rye; 1,442,638 to corn; 11,263 to sugar beets. No complete crop returns are available; wheat is reported at 4,167,000 quintals for 1912; rye, 435,000; barley, 1,003,000; oats, 733,000; corn, 6,739,000. There were reported in the country Dec. 31, 1910: 965,208 cattle; 3,808,815 sheep; 125,617 horses; 836,544 swine; 627,427 goats. Over 135,000 hectares are in worked forest, 167,000 in unworked forest.

The output of the mines was valued in 1911 at 15,413,945 dinars: 8,165,731 dinars copper; 3,775,776, coal; 1,433,603, gold; etc. Meat packing, milling, brewing, distilling, sugar refining,

carpet-weaving, etc. were the principal manufacturing industries.

COMMERCE. In the table below is shown the trade for three years, values in dinars:

	1910	1911	1912
Imports .....	84,697,000	115,425,000	106,098,000
Exports .....	98,888,000	116,916,000	84,221,000

The principal articles of export (values for 1912 in thousands of dinars) follows: wheat, 17,771; meat, 15,280; corn, 7396; skins, 7332; poultry, 3751; live animals, 2130; prunes, 1764. The principal countries of origin and destination were Austria-Hungary, Germany, Turkey, Russia, France, Italy, United Kingdom, United States, Belgium, Rumania, Bulgaria, etc.

FINANCE. The unit of value is the dinar (par value, 19.295 cents). Official financial statistics are at present unavailable. Some details of the 1913 budget are reported as follows: 30,613,000 dinars revenue from direct taxes; 31,655,698 from monopolies; 14,500,000 from customs; 16,000,000 from state railways; 9,001,000, excise; 8,402,000, fines; 5,547,485, domains; 4,100,000, posts and telegraphs; 5,825,165, various; 5,093,365, extraordinary. Expenditure for service of the debt, 32,395,550; civil list, 1,450,000; court employees, 45,650; skupahina, 663,000; council, 198,380, etc. The 1914 budget balanced at 214,321,000 dinars.

GOVERNMENT. The Serbian government has been established in Corfu. On July 28, 1914, Austria-Hungary declared war on Serbia, but it was not until Oct. 6, 1915, that Serbia was invaded. On Oct. 9, 1915, Belgrade was occupied by Austro-German troops; on October 11th, Bulgarians invaded Serbia. On the same day Semendria was captured by the Austro-Hungarians; and on October 22nd, the Bulgarians occupied Uskub. On November 1st, Kragujevats, the principal Serbian arsenal, fell to the Austro-Germans, and on November 5th Nish was captured by the Bulgarians. On Nov. 28, 1915, the main military operations came to an end, leading finally—after Prizrend, on November 30th, and Monastir, on December 2nd, had fallen to the Bulgarians—to an Austro-Bulgarian occupation of the country.

No trustworthy detailed account of Serbian affairs was obtainable after the downfall of the state, which followed the great campaign of the Central Powers at the close of the preceding year. Reports as to the continuance of relief work appeared in the press, and there were rumors that the copper mines were again in operation. The Serbian government, including the king, escaped by way of Scutari and the king went to Saloniki and the cabinet to Brindisi and afterward to Corfu. Premier Pashitch represented Serbia at the Allied Conference of March 27th at Paris. See WAR OF THE NATIONS.

SERBIAN RELIEF. See RELIEF FOR WAR VICTIMS, section *Serbia, Armenia, and Syria*.

SEROTHERAPY. Stefanowicz has applied autoserotherapy in a case of epidemic meningitis which was refractive to antimeningococcus serum, in the following way: The fluid obtained by lumbar puncture was sterilized by exposure in a thin layer to the sunlight for three hours, it being known that only two hours' exposure is necessary to kill the meningococcus. Ten c.c. of this sterile spinal fluid

was injected under the skin on each side of the spine at the same time that antimeningococcus was given by lumbar puncture. Improvement was prompt and recovery complete in three weeks.

In tetanus (q.v.) also the subcutaneous method has proved of value in the hands of Bacri, who reports that he has given 50 to 60 c.c. of antitetanus serum subcutaneously, repeating the dose daily for about a week. All of his 13 cases recovered and the modification of the symptoms which took place under these large doses was remarkable.

SEVENTH DAY ADVENTISTS. See ADVENTISTS.

SEVENTH DAY GERMAN BRETHREN. See BRETHREN, CHURCH OF THE.

SEWERAGE AND SEWAGE TREATMENT. After ten years of work Baltimore, Md., brought to completion the most extensive sewerage system ever constructed within a decade by an American city and the largest sewage-treatment works yet built in the United States. Portions of the sewers and treatment works had been in operation for a number of years, but when active construction was started in 1906 the city was practically without sewers for the removal of house or domestic sewage, and while it had spent considerable sums for building storm sewers, yet it had nothing like a storm sewer system. The Baltimore sewerage system comprises about 800 miles of sewers, ranging in diameter from 8 inches to 29 feet; three huge sewage pumps with a capacity of 27,500,000 gallons each in 24 hours to lift about one-third the sewage of the city from a low level; and a sewage treatment plant consisting of rough and fine screens, hydrolytic tanks, Imhoff tanks, separate sludge-digesting tanks, final settling basins, sludge-drying beds, and 30 acres of sprinkling filters. A part of the work was the covering in of Jones Falls, a stream in the heart of the city that was becoming an open sewer. The cover or roof over this stream serves also as a boulevard for some distance. The work outlined cost about \$23,000,000 and was carried out under the direction of Calvin W. Hendrick, chief engineer. While no American city approaching Baltimore in size remained without a sewerage system until so late a day as it did, there are numerous fairly large cities with very inadequate systems and many small ones with only the beginnings of a system or practically no sewers at all. Many cities which had a large mileage of sewers lacked a sewerage system, the sewers having been built piecemeal, with outlets at the handiest point on the waterfront. Cincinnati, Ohio, started to remedy this defect by building intercepting sewers, which will ultimately be followed by treatment works. At Milwaukee, Wis., intercepting sewers were also being built to pick up the sewage of the whole city and bring it to a central pumping station and treatment plant (see paragraph *Sewage Treatment* below). Lesser cities were doing much the same sort of intercepting sewer work as Cincinnati and Milwaukee in order to divert untreated sewage from points on streams, lakes, or the ocean where it causes local nuisance and carry it to some point where it can be got rid of without offense. In case the volume of natural water is not large enough to so dilute and oxidize the sewage as to obviate a nuisance, treatment

works are needed, the degree of treatment depending upon the ratio of sewage to water, the use to which the water receiving the sewage is put, and other local conditions. All these governing conditions should be made the subject of careful study by competent sanitary engineers.

**PROPOSED CODE FOR SANITARY CONTROL OF WATERWAYS.** Gross popular misconception of the principles that should guide attempts to conserve natural waters from sewage pollution still prevails. As a rule laymen have little interest and opinion on the subject or else go to the other extreme and demand the impracticable. Sanitary engineers who have been working the longest and most effectively to conserve streams, lakes, bathing beaches, and shellfish waters from sewage pollution agree that there is a legitimate use of natural waters for sewage disposal and that it is abuse rather than use that should be fought. To this end, and with full recognition of the relation of sewage disposal and water-supply to health, a proposed code for the sanitary control of waterways was drawn up after long and careful study by a committee of the sanitary section of the American Public Health Association and submitted to the section in October, 1916. After consideration for a year the code was to come up for adoption in 1917. Its six sections, without explanatory notes, are so brief and illuminating as to warrant reprinting—all the more so because they were designed to receive widespread consideration and discussion before final action was taken. (The chairman of the committee was Harrison P. Eddy, 14 Beacon Street, Boston, Mass. The full report of the committee was to appear during 1917 in *The Journal of the American Public Health Association*.) The main part of the code is as follows:

"I. There shall be no objectionable deposits at any point in a waterway as a result of sewage or other wastes discharged therein.

"II. There shall be no local nuisance created at or in the vicinity of any sewage or industrial-wastes outfall, arising from excessive turbidity or the production of odors.

"III. There shall be no general nuisance created in a waterway due to excessive turbidity or to odors, as a result of sewage or other wastes discharged therein.

"IV. There shall be no interference with or undue burden upon mechanical operation or bacterial efficiency of water-purification plants procuring their raw water from a waterway.

"V. There shall be no active (potentially dangerous) bacterial contamination or gross pollution of properly located and authorized shellfish beds.

"VI. There shall be no active (potentially dangerous) bacterial contamination or gross pollution of properly located and authorized bathing beaches and other bathing places."

**SEWAGE TREATMENT.** The term "treatment" rather than "purification" is now preferred and used by many sanitary engineers because the latter implies more than is attempted in the great majority of works for the treatment of sewage. The object to be attained by sewage treatment works ranges all the way from the removal of coarse floating matter, which may be accomplished by rough or coarse screening, to the removal of practically all matter in suspension, together with the conversion of or-

ganic matter to a non-putrescible state and the reduction, or, in rare cases, the complete feasible removal, of bacteria. Much of the suspended matter may be removed by fine screens, but if the process is to be fairly complete then sedimentation or filtration, and more usually a combination of the two, is required. Where a non-putrescible effluent is needed resort is almost always had to filtration, but the same result may be obtained by the activated-sludge process that is claimed for the electrolytic process. Neither of these two, however, had been accepted by sanitary engineers generally as being on a satisfactory physical and economic basis. For high bacterial reduction, chlorine disinfection was coming into quite extensive use, but dependence continued often to be placed on intermittent sand filtration, where sand of suitable character could be had at reasonable cost. The activated-sludge process effects a high degree of bacterial removal. As matters stood in 1916, rough screening was widely used; fine screens here and there in the United States and much more commonly on the continent of Europe; septic tanks for sedimentation and sludge reduction—one-story Cameron with a few two-story Trovis in England, one-story Cameron for old and two-story Imhoff for new installations in the United States, and also two-story Imhoff in Germany; contact beds for the older and more generally sprinkling filters for the newer plants in the United States and England, with intermittent sand filters in many places in the United States; and disinfection with either hypochlorite of lime (bleaching powder) or else liquid chlorine wherever disinfection is attempted.

The activated-sludge process made considerable progress in the United States and Canada during 1916 and some advance in England, but, as already stated, it was not yet established as an economically practicable method of sewage treatment, open for general adoption under various local conditions. Milwaukee, Wis., and Cleveland, Ohio, had good-sized working-scale plants in use and were making extensive studies of results and costs, and Milwaukee expected to make a large additional installation of activated-sludge units, in the hopes that the process would prove so satisfactory as to warrant its use for the sewage of the whole city. Two large plants were under construction at Houston, Texas, designed to treat the sewage of the entire city. A few small places had built activated-sludge plants to treat all their sewage and a number of other places were experimenting with the process on a working scale. The stockyards interests at Chicago seemed to be convinced that the process was practicable for their district. Briefly, the activated-sludge process consists in forcing air under pressure through sewage in a tank in the presence of an accumulation of sludge previously activated or bacterially enlivened by air. The air is admitted at the tank bottom through porous plates or else through perforated pipes. As it rises it carries the sludge with it and keeps the sludge thoroughly distributed through the sewage. When the sewage so treated is drawn off it contains much sludge in suspension, but this settles quickly, leaving a fairly clear and non-putrescible liquid. From time to time a portion of the sludge is drawn off. The best means of sludge disposal had not yet been determined.

It was hoped that the high nitrogen content of the sludge would make it of sufficient commercial value as a fertilizer base to pay for at least the cost of recovery, but the high water content of the sludge and the necessity for drying to a per cent moisture basis if it is to go to the fertilizer factories made the commercial outcome uncertain until methods of sludge treatment had been carried further than had yet been done. Thus far, it seemed necessary to employ sedimentation, pressing, and drying to reduce the water in the sludge from its original 99 per cent of volume to the commercial requirement of 10 per cent.

**SEX DETERMINATION.** See ZOOLOGY.

**SEX HYGIENE.** See EUGENICS; INSANITY; NATIONAL BIRTH CONTROL LEAGUE.

**SHACKELTON, SIR ERNEST.** See POLAR RESEARCH, *Antarctic*.

**SHAKESPEARE TERCENTENARY.** See DRAMA; LITERATURE, ENGLISH AND AMERICAN; MUSIC, *General News*.

**SHARKS.** See ZOOLOGY, *Fish*.

**SHAW, GEORGE BERNARD.** See DRAMA.

**SHEA, JOSEPH HOOKER.** See UNITED STATES, *Diplomatic Service*.

**SHEEHAN, JOHN CHARLES.** An American lawyer and politician, died in New York City Feb. 9, 1916. He was born in Buffalo, N. Y., in 1848, and lived there till 1886, practicing law and holding the offices of city assessor and controller. By President Cleveland, whom Mr. Sheehan had aided in his campaign for the governorship, the post of superintendent of the Indian schools was offered him, but he declined. After removing to New York he identified himself with Tammany Hall, became a district leader, and gained the confidence of Richard Croker, so that when Croker retired as head of Tammany in 1894, he appointed Mr. Sheehan his successor. This post he held till Croker's return in 1902. Meanwhile he had held various offices, secretary and auditor of the Aqueduct Commission till 1892, and then for three years police commissioner of New York. As a lawyer, he gained his biggest success, when, after nine years, the Long Acre Electric Light and Power Company, of which he was counsel, won its fight for the right to manufacture and sell electric current in New York City.

**SHEEP.** See STOCK RAISING.

**SHERMAN, FRANK DEMPSTER.** An American educator and writer of light verse, died in New York City Sept. 19, 1916. He was born at Peekskill, N. Y., in 1860. He graduated in 1884 from the School of Architecture at Columbia University and later went to Harvard University for a year. In 1887 he was appointed assistant in architecture at Columbia, adjunct professor of architecture in 1891, and professor of graphics in 1904. He became widely known as a writer of verse, was deeply interested in genealogy, and wrote a complete genealogy of the Sherman family. He was elected a member of the National Institute of Arts and Letters. His publications include: *Madrigals and Catches* (1887); *New Waggings of Old Tales* (1888), with John Kendrick Bangs; *Lyrics for a Lute* (1890); *Little-Folk Lyrics* (1892); *Lyrics of Joy* (1904); *A Southern Flight* (1906), with Clinton Scollard.

**SHIPBUILDING.** With the destruction of merchant shipping through the war and the demand for bottoms to carry cargoes to and

from various nations whose normal production and trade had been interrupted, the building of ships for commerce was indeed important in 1916. Naturally in the belligerent countries at the end of the year few if any authoritative reports and statistics were available, but the United States Bureau of Navigation estimated that the merchant shipping built in the world during the calendar year 1916 numbered 2505 vessels of 1,899,943 gross tons, while during the same period 1149 vessels of 2,082,683 gross tons were lost through war causes, a net reduction of about 200,000 gross tons, or one-half of 1 per cent of the world's merchant shipping, which comprised 48,683,136 gross tons, according to Lloyd's Register in June, 1916. See SHIPPING.

The construction of merchant ships for 1916 may be divided as follows:

Country	Vessels	Gross tons
Built in the United States . . . . .	1,218	560,239
Built in the United Kingdom and British Dominions . . . . .	510	619,336
Built in other foreign countries . . . . .	782	720,368
Total . . . . .	2,505	1,899,943

The figures for countries outside of the United States were derived from the annual shipbuilding review of the Glasgow (Scotland) *Herald*, usually accepted as authoritative, subject to minor modifications from official publications, which appear much later. Of the United Kingdom totals, 412 merchant vessels of 582,305 gross tons, the Glasgow *Herald* was compelled to state that in accordance with the request of the Admiralty and the Board of Trade, all details of the work done in the shipbuilding yards of the United Kingdom were necessarily omitted, but that the returns from all the districts had been compiled with as much detail as in previous years and the bare totals announced possessed their usual authority. For the British Dominions the *Herald's* returns covered in detail 98 vessels of 37,031 gross tons, making a total for the United Kingdom and British Dominions of 510 vessels of 619,336 gross tons.

The figures for other countries are summarized in the accompanying table. In some instances the totals include ships launched and not completed, offset in part by the fact that in some instances vessels completed late in December were not tabulated. Excluding warships the details for merchant vessels built in 1916 were as follows:

Country	Vessels	Gross tons	Country	Vessels	Gross tons
Japan . . . . .	250	246,234	Denmark . . . . .	80	37,150
Holland . . . . .	297	208,180	Germany . . . . .	18	25,950
Italy . . . . .	80	60,472	Spain . . . . .	4	10,071
Norway . . . . .	70	44,903	China . . . . .	38	7,861
Sweden . . . . .	85	40,090			
France . . . . .	10	39,457	Total . . . . .	782	720,368

In commenting on its figures the Glasgow *Herald* remarked:

"In Japan the total was almost three times that of 1915, the increase being accounted for principally by the construction of a good many large cargo steamers. In Holland the shipbuilders have been working under exceptional difficulties, and one firm states in its report that owing to the increasing difficulty of obtaining materials stagnation in the industry is threatened. With regard to the German figures, it is

not for a moment pretended that these represent the work done in that country. They only represent the work of which information has been received, and these are probably a small part of the total, while the reports, particularly those respecting the two warships understood to have been launched, were not always very definite."

**GREAT BRITAIN.** With many private yards working on government vessels and a shortage of labor and supplies, it was inevitable that there should be a decreased tonnage for the year. Among the figures available were some summaries of output along the Clyde where the tonnage was very small compared even with 1915, when the mercantile total consisted of only 126 vessels, of 215,000 tons and 180,000 indicated horse power; and still more so with the figures for 1914, when the aggregates were 460,260 tons and 496,120 indicated horse power—all mercantile. In 1916 it was estimated that the measurement could not be much more than 150,000 tons. It was stated further that no high-powered mercantile vessels had been launched, and no really notable vessels of any kind. The most noteworthy were the twin-screw motor ship *Glenamoy*, of 7270 tons, built at Irvine by Harland & Wolff, Ltd., for the Glen Line of London and engined at Glasgow by the Burmeister & Wain Company, Ltd., and the geared turbine steamer *Westmoreland*, of 7500 tons, built by D. & W. Henderson & Co., Ltd., at Patrick, for the Federal Steam Navigation Company, Ltd., also of London, and engined by the Parsons Marine Steam Turbine Company, Ltd., Wallsend-on-Tyne.

Excluding an oil tank vessel of 5000 tons at Dumbarton, two Lampport & Holt steamers of 7300 tons at Govan, and a British India steamer of 8250 tons at Whiteinch, the list of launchings included only medium sized cargo vessels and a fair number of craft of small size.

British shipbuilders were paying more attention to internal combustion engined ships, and the most important order placed during the year was for four sister ships, each with a carrying capacity of over 13,000 tons and a speed of about 13 knots—which would make them the largest and fastest motor vessels yet to be constructed for purely mercantile work. The length of these vessels was to be approximately 470 feet, and the engines to be fitted in each craft would be two four-cycle motors of the type installed in the Glen liners *Glenamoy* and *Glengyle*, but much larger. They were to be eight-cylinder machines, each developing 3200 indicated horse power, giving a total machinery power of 6400 indicated horse power. These engines were to be built on the Clyde, as no doubt the hulls also, the orders being in the hands of Harland & Wolff, Ltd., and it was hoped that all four ships would be completed well within two years.

**GERMANY.** Shipbuilding in Germany in 1916 approximated in its results the figures of the previous year, but there were an increasing number of contracts for new tonnage and a general extension of the shipyards and increased facilities to take care of future business. Referring to these improvements the *Hamburger Fremdenblatt* said about the end of the year:

"This places our shipbuilding yards in a position to continue their activity for the mercantile marine while at the same time proceeding with their important work for the navy, and thus Germany is assured of a superiority over the

commercial fleet of England, whose yards are overburdened with war work to such an extent that the building of merchant ships must necessarily be postponed."

It was stated officially that the tonnage built in German shipyards since the outbreak of the war to the end of 1916 had exceeded three-quarters of a million, and that preparations were being made for great activity after the cessation of hostilities. Harbor improvements were being made at Bremen, Stettin, and Hamburg, and the extension of the German canal system was hoped to stimulate increased production of light draft vessels and barges.

In connection with the development of the internal combustion motor, a field where, prior to the war, Germany had accomplished considerable, an important step was taken by the establishment of a motor shipbuilding yard at Hamburg by the Allgemeine Elektrizitäts Gesellschaft—an enterprise with which the Hamburg-American Line was also closely associated.

One indication of the prosperous situation of the German shipbuilding industry in war times was afforded by the report of the Howaldt Works, Kiel, for the year 1915-16. This concern, which shortly before the war was in serious financial difficulties, was able to declare a dividend of 8 per cent, or 3 per cent higher than its previous distribution. The works, it is stated in the report, were "employed at their full capacity throughout the year; overtime was constant, and in some departments work was carried on day and night for long periods." For the year 1916, it was declared, the company was provided with contracts which would keep the works fully engaged for some time ahead.

**JAPAN.** So prosperous was the Japanese shipbuilding industry in 1916, that the Japanese government was considering the question of reducing the national assistance hitherto extended to shipbuilding. Such assistance, however, had been so advantageous that when the war broke out in Europe and many ships were diverted from commercial to naval purposes, Japanese shipowners made great profits. Highly remunerative freight rates were earned by Japanese ships and proved even a greater stimulus than the government subsidies granted. This growth in shipbuilding, however, resulted in a heavy increase in the amount which the government was called upon to pay to shipbuilders. In 1914 these payments amounted to \$815,000, in 1916 they were estimated to be \$1,561,000, and in 1917 they were expected to be about \$2,900,000. In eight months of 1916 120,000 tons of new steamships were launched from Japanese yards. During the five years prior to the outbreak of the European war only 49,000 tons of steamships were built annually in Japan, or about one-third of eight months' output in 1916. Before the war Japan used to purchase about 100,000 tons of steamships every year from abroad.

**AMERICAN CONSTRUCTION.** In the United States during the calendar year 1916 private shipyards built 1163 merchant vessels, of 520,847 gross tons, which were officially numbered for American shipowners. American shipbuilders also built 50 vessels of 39,392 gross tons for foreign owners, making a total output of 1213 vessels, of 560,239 gross tons, for the 12 months. The record output for the United States was 614,216 gross tons built during the 12 months

ended June 30, 1908, and the 1916 record was also exceeded during the fiscal year 1855, when 583,450 gross tons were built, all of wood except seven iron vessels of 1891 gross tons. Of the 1916 output 152 vessels, of 414,029 gross tons, were built of steel, which was exceeded by the output of 149 steel vessels, of 450,017 gross tons, during the fiscal year 1908. The output of that year, however, was mainly for the Great Lakes, while most of the steel tonnage of 1916 was built for the ocean foreign trade.

The accompanying details of vessels built and officially numbered in the United States in 1916, compared with 1915, were reported by the Bureau of Navigation:

suffered heavily. Of ships building or ordered in the United States on July 1, 1916, fully 125,000 gross tons were for foreign shipowners. The first of these large steamships, the *Antwerpen*, 7955 gross tons, was transferred to the Netherlands flag soon after completion, and on her initial voyage was destroyed with a valuable cargo. Since July 1, 1916, the tonnage ordered in American yards for foreign shipowners exceeded that ordered for American owners. The fact that between 10 and 15 per cent of the merchant tonnage building at the end of 1916 was in American yards was a matter of promise for the future of the industry.

The steel merchant vessels building or under

1916

Kinds	Atlantic and Gulf		Pacific		Great Lakes		Western rivers		Total	
	No.	Gross tons	No.	Gross tons	No.	Gross tons	No.	Gross tons	No.	Gross tons
<b>Wood—</b>										
Sailing	45	12,892	8	8,903	10	795	16	1,706	51	16,795
Steam	26	8,999	14	4,472	10	795	16	1,706	66	13,972
Gas	229	7,423	166	8,719	34	615	97	1,613	526	18,370
Unrigged	242	82,074	79	9,080	35	4,625	26	922	382	96,701
<b>Total</b>	<b>542</b>	<b>106,888</b>	<b>265</b>	<b>29,174</b>	<b>79</b>	<b>6,035</b>	<b>139</b>	<b>4,241</b>	<b>1,025</b>	<b>145,838</b>
<b>Metal—</b>										
Sailing	1	562	...	...	1	2,320	...	...	2	2,882
Steam	50	193,827	10	63,931	35	88,464	7	1,094	102	347,316
Gas	8	7,672	1	213	6	9,808	4	1,509	19	19,202
Unrigged	9	3,977	...	...	4	1,608	2	24	15	5,609
<b>Total</b>	<b>68</b>	<b>206,038</b>	<b>11</b>	<b>64,144</b>	<b>46</b>	<b>102,200</b>	<b>13</b>	<b>2,627</b>	<b>138</b>	<b>375,009</b>
<b>Totals—</b>										
Sailing	46	13,454	6	3,903	1	2,320	...	...	53	19,677
Steam	76	197,826	24	71,408	41	89,259	23	2,800	164	361,288
Gas	237	15,095	167	8,922	44	10,423	101	3,122	549	37,572
Unrigged	251	86,051	79	9,080	39	6,233	28	946	397	102,310
<b>Grand total</b>	<b>610</b>	<b>312,426</b>	<b>276</b>	<b>98,818</b>	<b>125</b>	<b>108,235</b>	<b>152</b>	<b>6,868</b>	<b>1,163</b>	<b>520,947</b>

1915

Kinds	Atlantic and Gulf		Pacific		Great Lakes		Western rivers		Total	
	No.	Gross tons	No.	Gross tons	No.	Gross tons	No.	Gross tons	No.	Gross tons
<b>Wood—</b>										
Sailing	48	12,916	2	31	...	...	...	...	50	12,947
Steam	289	7,526	234	8,251	110	1,736	96	1,890	729	19,408
Unrigged	196	45,037	98	6,218	29	2,717	27	381	345	54,353
Built of concrete	2	565	...	...	...	...	...	...	2	565
<b>Total</b>	<b>535</b>	<b>66,044</b>	<b>329</b>	<b>14,500</b>	<b>139</b>	<b>4,453</b>	<b>123</b>	<b>2,271</b>	<b>1,126</b>	<b>87,268</b>
<b>Metal—</b>										
Sailing	1	27	...	...	...	...	...	...	1	27
Steam	36	96,117	6	9,646	17	18,358	18	658	72	124,779
Unrigged	5	2,489	1	434	3	509	8	96	17	3,528
<b>Total</b>	<b>42</b>	<b>98,633</b>	<b>7</b>	<b>10,080</b>	<b>20</b>	<b>18,867</b>	<b>21</b>	<b>754</b>	<b>90</b>	<b>128,334</b>
<b>Totals—</b>										
Sailing	49	12,943	2	31	...	...	...	...	51	12,974
Steam	325	103,643	240	17,897	127	20,094	109	2,548	801	144,182
Unrigged	201	47,526	94	6,652	32	3,226	35	477	362	57,881
Built of concrete	2	565	...	...	...	...	...	...	2	565
<b>Grand total</b>	<b>577</b>	<b>164,677</b>	<b>336</b>	<b>24,580</b>	<b>159</b>	<b>23,320</b>	<b>144</b>	<b>3,025</b>	<b>1,216</b>	<b>215,602</b>

During the fiscal year 1915-16 American shipyards began the extensive construction of ocean steamships for foreign owners, mainly Norwegians. Much of the new shipbuilding for Norwegian owners was taking place on the Pacific coast and it was said that they were so liberal in their advances that a number of yards could be established. While Scandinavian owners had benefited by the war, they had also

contract to be built in private American shipyards on Dec. 31, 1916, according to builders' returns to the Bureau of Navigation, numbered 403, of 1,495,601 gross tons, the largest tonnage in the history of American shipbuilding. During December, 1916, American yards finished nine steel merchant vessels of 24,363 gross tons and made new contracts for 29 vessels of 105,120 gross tons. The accompanying tabulation shows



the types of steel merchant vessels building or under contract on July 1, 1916, and on Dec. 31, 1916, respectively:

Type	Number July 1, 1916	Gross tons	Number Dec. 31, 1916	Gross tons
Cargo vessels .....	240	639,817	294	1,002,398
Oil and molasses tankers	80	500,608	76	429,916
Passenger-and-cargo vessels .....	8	52,328	7	50,728
Car floats and ferries ..	24	20,064	8	5,914
Towing vessels .....	14	2,572	11	2,387
All others .....	19	10,895	7	4,258
<b>Total .....</b>	<b>365</b>	<b>1,225,784</b>	<b>408</b>	<b>1,495,601</b>

American builders expected to launch during the calendar year 1917 357 vessels of 1,250,722 gross tons, and in the calendar year 1918 46 vessels of 244,879 gross tons. Wooden merchant vessels of 500 gross tons or over building or under contract to be built in private American shipyards on Dec. 31, 1916, numbered 161, of

kirk, France; and an oil tanker of 10,050 tons at Newport News.

See BATTLESHIPS AND OTHER WAR VESSELS; NAVAL PROGRESS; SUBMARINES.

**SHIPPING.** In maritime industry the year 1916 stands out as a period of destruction due to the more vigorous prosecution of the war at sea. This involved a striking decrease in the world's shipping amounting to over 400,000 tons in two years in place of a normal increase of about 4,000,000 tons in the same period. The main features of the year were the more than active employment of the merchant tonnage of the Allied nations, the disappearance of the Teutonic nations from the sea-borne carrying trade, and the vigorous prosecution of commerce on the part of the various neutral nations. The effects of two years of war are forcibly shown in the accompanying table from the Annual Report of the United States Commission of Navigation which shows the changes in the merchant tonnage of the world:

June 30—	Allies	Central Powers	United States	Other neutrals	Total
1914 .....	28,324,384	6,848,173	5,368,194	8,748,801	49,089,552
1915 .....	28,630,927	5,857,399	5,892,639	8,880,804	49,261,769
1916 .....	28,598,880	5,144,958	6,148,861	8,790,937	48,688,136

207,623 gross tons, according to builders' returns to the Bureau of Navigation.

The geographical distribution of tonnage under construction is shown by the following table:

Geographical division	No.	Total construction		Sail and unrigged		Power	
		Gross tons	No.	Gross tons	No.	Gross tons	
New England .....	26	a 24,823	26	a 24,823	..	.....	
Middle Atlantic coast .....	36	84,112	35	83,112	1	1,000	
South Atlantic and Gulf coasts .....	35	a 41,450	13	a 8,170	22	88,280	
Puget Sound and Columbia River .....	52	a 88,200	2	a 2,300	50	85,900	
California coast .....	12	19,038	2	2,500	10	16,538	
<b>Total .....</b>	<b>161</b>	<b>a 207,623</b>	<b>78</b>	<b>a 70,905</b>	<b>83</b>	<b>186,718</b>	

a Tonnage incomplete.

**LARGE VESSELS.** A feature of construction in all countries was that practically all the craft built were cargo boats, with a few notable exceptions. In the United Kingdom the Royal Mail steamer *Brecknockshire*, of 12,000 tons, was launched at Belfast, and the Ocean Line steamer *Tyndareus*, of 11,000 tons, at Greenock. The largest merchant ship of the year, the turbine liner *Paris*, of 24,000 tons and 45,000 indicated horse power, was launched at St. Nazaire. There was also the Italian turbine liner *Duilo*, of 21,700 tons and 22,000 indicated horse power, launched at Sestri Ponente; while in Germany a Hamburg-South American liner of 21,500 tons was said to have been launched at Hamburg. Two splendid Italian steamers, *Milazzo* and *Volturno*, each of 11,477 tons, were built at Spezia; a cargo steamer of 10,700 tons at Dun-

periods, that for 1914 being just before the outbreak of the war:

June 30—	Foreign trade	Coasting trade		Total
		Great Lakes	Sea and rivers	
1914 .....	1,076,152	2,882,922	8,969,614	7,928,688
1915 .....	1,871,543	2,818,000	8,699,886	8,389,429
1916 .....	2,191,715	2,760,815	8,517,119	8,469,649

Not only did the United States possess a greater amount of tonnage in 1916 than before the war, but it was increasingly used, and the clearances in net tons of 100 cubic feet of closed in ship space available for cargo carrying are also of interest. The accompanying table indicates the activity of American and other ships in the over-seas export trade of the United States for the fiscal years ended June 30th:

Clearances for—	American		Foreign		1916
	1914	1915	1914	1915	
Europe .....	447,667	880,383	1,184,952	19,598,524	17,779,418
South America .....	192,479	514,966	945,853	2,237,171	1,428,600
Asia .....	72,218	32,120	131,198	1,165,083	1,059,328
Australia, etc. ....	28,615	78,718	157,390	724,189	571,482
Africa .....	4,263	41,075	79,412	402,194	396,955
<b>Total (net tons) .....</b>	<b>745,242</b>	<b>1,546,962</b>	<b>2,448,805</b>	<b>24,127,161</b>	<b>21,335,738</b>
<b>Increase (+) or decrease (—) .....</b>	<b>.....</b>	<b>+801,720</b>	<b>+901,848</b>	<b>.....</b>	<b>-2,891,878</b>
					<b>23,026,796</b>
					<b>+1,791,018</b>

**TONNAGE LOST IN 1916.** According to the records kept and statistics carefully compiled by the *Journal of Commerce and Commercial Bulletin* (New York) during the 29 months since the beginning of the war, up to and including Dec. 31, 1916, approximately 2146 merchant vessels, of all types and classes, were destroyed as a result of the operations of belligerents on the seas, principally by mines and submarines. The activities of the submarines in the Mediterranean were particularly destructive, while longer cruises by these craft increased the area of their destruction. The aggregate gross tonnage of the destroyed vessels, exclusive of a considerable number whose tonnage is not recorded, was 3,982,556 tons, or more than the tonnage owned by any nation except Great Britain, Germany, and the United States. Of this total, 1149 vessels, with an aggregate gross tonnage of 2,082,683 tons, were destroyed in 1916. The campaign of 1916 was particularly severe on neutral shipping, for Norway, France, Italy, Belgium, Holland, the United States, Denmark, Greece, and Spain lost more merchant vessels in 1916 than during the preceding 17 months of the war.

The accompanying table prepared by the *Jour-*

**GROSS TONNAGE OF MERCHANT SHIPS DESTROYED**

	To Jan. 1, 1916	1916	Total
Great Britain	1,225,498	1,184,650	2,360,148
Norway	108,023	265,528	368,546
France	125,978	130,851	256,829
Italy	60,217	151,510	211,727
Germany	161,888	32,554	194,442
Holland	36,848	80,481	117,324
Greece	13,227	67,971	81,198
Denmark	33,298	48,880	82,123
Sweden	32,667	44,955	77,622
Russia	34,193	29,699	63,892
Spain	5,223	39,293	44,516
Belgium	12,211	15,080	27,291
Japan	16,015	10,709	26,724
United States	10,377	14,181	24,558
Turkey	18,150		18,150
Austria-Hungary	13,240	4,238	17,478
Portugal		5,563	5,563
Rumania		3,688	3,688
Canada		3,464	3,464
Brazil		2,258	2,258

*nal of Commerce* shows the total losses of each nation, the losses up to Jan. 1, 1916, and the losses in that year.

To appreciate fully the damage done to ship-

Flag—	Steam and sailing vessels, owned according to Lloyd's Register Book, 1915-1916		Gross tons of sail and steam vessels destroyed in war (29 months)	
	No.	Tons	No.	Tons
Un. Kingdom	9,285	19,541,364	1,089	2,360,148
British Colonies	2,068	1,732,700	1	3,464
* United States	2,530	3,522,913	10	24,558
Austro-Hung'n.	433	1,018,210	8	17,478
Danish	835	854,966	80	82,133
Dutch	809	1,522,547	55	117,324
French	1,539	2,285,728	125	256,829
German	2,166	4,706,027	80	194,442
Italian	1,177	1,736,545	111	211,727
† Japanese	1,155	1,826,029	8	26,724
Norwegian	2,174	2,529,188	308	368,546
Russian	1,256	1,054,762	55	63,892
Spanish	642	899,204	21	44,516
Swedish	1,462	1,122,888	85	77,622

\* Excluding vessels trading on the Great Lakes of North America. † Japanese sailing vessels are not inserted in Lloyd's Register Year Book and are therefore not included in this table.

ping it is desirable to consider the total losses of the principal nations to Dec. 31, 1916, compared with the number of ships and the amount of tonnage of their merchant marine, as shown in the preceding table.

While many of the vessels destroyed were small yet many large ships suffered. The British steamer *Britannic*, built for the transatlantic service of the White Star Line, but never used except as a hospital ship, was the largest vessel sunk in 1916, striking a mine in the Adriatic Sea. She was the largest British ship afloat. Eight ships of more than 10,000 gross tons each were sunk during the year, five of them British, as follows:

Name and flag	Gross tons
Britannic, British	48,158
Franconia, British	18,150
Tubantia, Dutch	15,000
Gallia, French	14,966
Alaunia, British	13,405
Cymric, British	13,370
Antwerpen, Dutch	11,300
Rowanmore, British	10,320

One feature of the war as regards shipping was the extent, and the increasing extent, that neutral vessels suffered. Belligerent tonnage destroyed in 1916 amounted to 1,522,006 gross tons, or only about 73 per cent of the total destroyed during the year. Great Britain's losses to the end of 1916 represented something more than half of the total, while Norway, which stood second on the list, contributed less than 10 per cent. Norway lost during 1916 more tonnage than any belligerent except Great Britain during the entire war period, and her whole loss was more than that of the Teutonic Powers or the combined losses of any other three neutral nations. The accompanying table shows the proportionate share of tonnage losses:

	To Jan. 1, 1916	1916	Total
<b>Allies—</b>			
Tonnage	1,474,112	1,485,214	2,959,326
Per cent	77.5	71.3	74.3
<b>Neutrals—</b>			
Tonnage	234,658	563,502	738,155
Per cent	12.3	26.9	19.9
<b>Teutons—</b>			
Tonnage	193,278	36,792	230,070
Per cent	10.2	1.8	.58

**WORLD'S SHIPPING IN 1916.** In the table on page 633 are given the number and net and gross tonnage of steam and sailing vessels of over 100 tons, of the several countries of the world, as recorded in Lloyd's Register for 1916-17.

**AMERICAN MERCHANT MARINE.** The accompanying official table shows the geographical distribution, motive power, and material of construction of vessels of the United States for the fiscal year 1916 in comparison with similar data for the year 1915:

**COMPARISON OF AMERICAN MERCHANT MARINE OF 1915 AND 1916**  
Total Merchant Fleet

Classification	1915		1916	
	No.	Gross tons	No.	Gross tons
<b>Geographical distribution</b>				
<b>Atlantic and Gulf coasts</b>				
	16,591	4,295,865	16,354	4,481,151

Classification Geographical distribution	1915		1916	
	No.	Gross tons	No.	Gross tons
Porto Rico	100	14,111	99	11,873
Pacific coast	4,972	1,109,259	5,074	1,114,801
Hawaii	44	13,361	51	16,257
Northern lakes	8,161	2,818,009	3,051	2,760,815
Western rivers	1,833	188,804	1,815	184,752
<b>Total</b>	<b>26,701</b>	<b>8,389,429</b>	<b>26,444</b>	<b>8,469,649</b>
<i>Power and material</i>				
<b>Sail:</b>				
Wood	5,706	1,088,091	5,222	1,012,375
Metal	160	296,383	160	298,562
<b>Total</b>	<b>5,866</b>	<b>1,384,474</b>	<b>5,382</b>	<b>1,310,937</b>
<b>Steam:</b>				
Wood	4,671	904,399	4,512	854,069
Metal	2,281	4,877,017	2,312	5,041,026
<b>Total</b>	<b>6,952</b>	<b>5,781,416</b>	<b>6,824</b>	<b>5,895,095</b>
<b>Gas:</b>				
Wood	8,925	152,360	9,157	159,016
Metal	71	10,034	80	15,952
<b>Total</b>	<b>8,996</b>	<b>162,394</b>	<b>9,237</b>	<b>174,968</b>
Canal: Wood	560	61,979	555	61,639
<b>Barges:</b>				
Wood	4,117	877,880	4,231	906,855
Metal	210	121,286	215	120,155
<b>Total</b>	<b>4,327</b>	<b>999,166</b>	<b>4,446</b>	<b>1,027,010</b>
<b>Grand total</b>	<b>26,701</b>	<b>8,389,429</b>	<b>26,444</b>	<b>8,469,649</b>

a Included in steam prior to 1915. b Includes 2 concrete barges of 565 gross tons.

During the fiscal year 1915-16 only 26 foreign built vessels of 69,697 tons were transferred to

the American flag under the Act of Aug. 18, 1914, as compared with 140 of 513,306 gross tons in 1914-15. This was due to the extensive legislation by European countries prohibiting the sale to foreign owners except under special conditions during the time of the war or some additional period. During the fiscal year 1915-16 160 merchant vessels of the United States of 102,479 gross tons were sold to aliens and transferred from the American to foreign flags, compared with 77 of 18,595 gross tons, so transferred during the previous fiscal year. The tonnage of American ships sold to aliens during the year 1915-16 was the largest of any year since the Civil War, when destruction by Confederate cruisers led for three years to the transfer of large amounts of tonnage. The 18-knot Pacific Mail Steamship *Siberia*, 11,306 gross tons, the fastest American steamship crossing the Pacific, was purchased by the Japanese Toyo Kaisen Kaisha, and its sister ship *Korea* was also transferred to the same owner. British owners purchased 26,825 gross tons, Japanese 13,988 gross tons, Norwegian 6804 gross tons, Spanish 5955 gross tons, and the balance was bought by citizens and subjects of other countries.

THE SHIPPING ACT. In the United States for over half a century there had been bitter conflict over the best methods of establishing or aiding the American merchant marine by some form of Federal interest or assistance. On Sep. 7, 1916, the so-called Shipping Act became a law after a long struggle in Congress. This act was a compromise measure passed only by the most

Flag	Steam		Gross tons	Sail		Total	
	Number	Net tons		Number	Net tons	Number	Tonnage
<b>British:</b>							
United Kingdom	8,454	11,505,570	18,825,356	615	809,501	9,069	19,134,857
Colonies	1,576	957,102	1,638,525	496	128,617	2,072	1,767,142
<b>Total</b>	<b>10,030</b>	<b>12,462,672</b>	<b>20,463,881</b>	<b>1,111</b>	<b>438,118</b>	<b>11,141</b>	<b>20,901,999</b>
<b>American (U. S.):</b>							
Sea	1,285	1,827,780	2,852,535	1,302	988,043	2,587	3,790,578
Northern lakes	561	1,674,491	2,225,900	31	92,323	592	2,318,223
Philippine Islands	58	23,408	37,780	8	2,280	66	40,060
<b>Total</b>	<b>1,904</b>	<b>3,525,679</b>	<b>5,116,215</b>	<b>1,341</b>	<b>1,082,646</b>	<b>3,245</b>	<b>6,148,861</b>
Argentinian	238	106,126	181,929	71	32,548	309	214,477
Austro-Hungarian	385	550,682	891,103	11	1,515	396	892,618
Belgian	144	168,903	264,985	5	7,175	149	272,160
Brazilian	377	175,158	290,637	51	18,168	428	308,800
Chilean	95	59,881	92,820	27	26,894	122	119,714
Chinese	80	61,939	97,841	2	543	82	98,384
Cuban	41	20,998	34,281	8	8,768	49	38,049
Danish	589	469,164	797,371	265	60,281	854	857,602
Dutch	697	913,608	1,486,368	95	22,548	792	1,508,916
French	998	1,057,796	1,851,120	512	865,523	1,510	2,216,643
German	1,708	2,333,321	3,890,542	245	261,010	1,953	4,151,552
Greek	361	449,578	717,045	78	16,222	439	733,267
Italian	684	1,085,815	1,685,720	517	210,814	1,201	1,896,534
Japanese	1,151	1,169,105	1,847,453	.....	.....	1,151	1,847,453
Mexican	41	24,481	40,084	10	3,388	51	43,472
Norwegian	1,795	1,358,579	2,263,900	460	507,122	2,255	2,771,022
Peruvian	17	12,509	23,342	46	23,783	63	47,125
Portuguese	164	185,387	303,706	103	30,785	267	334,491
Rumanian	35	34,577	60,205	1	393	36	60,598
Russian	753	514,007	875,146	498	193,356	1,251	1,068,502
Spanish	552	496,411	815,166	54	14,670	606	829,836
Swedish	1,037	538,302	926,650	343	98,370	1,380	1,025,020
Turkish	113	49,192	83,087	66	17,701	179	10,788
Uruguayan	41	21,477	35,980	13	14,624	54	50,604
<b>Other countries: Albania, Bulgaria, Colombia, Costa Rica, Ecuador, Egypt, Haiti, Honduras, Liberia, Montenegro, Nicaragua, Oman, Panama, Persia, Salvador, Samos, Sarawak, Siam, Tunis, Venezuela, Zanzibar, etc.</b>							
	76	34,568	59,746	79	28,500	155	88,246
Not recorded	26	30,995	51,401	23	10,002	49	61,403
<b>The world</b>	<b>24,132</b>	<b>27,858,260</b>	<b>45,247,724</b>	<b>6,035</b>	<b>8,435,412</b>	<b>30,167</b>	<b>48,683,136</b>

vigorous political pressure, after a more comprehensive bill looking towards direct government ownership was defeated. The Shipping Act established a board of five members who were authorized (a) to procure by purchase or construction cargo ships to the value of \$50,000,000 and set them at work in carrying American merchandise to foreign countries, and (b) to regulate the rates and general business practices of the American merchant marine much as was done by the Interstate Commerce Commission for the land carriers. The act was criticized as combining in a single law two entirely different classes of functions, as the board was authorized to secure and operate government-owned ships directly in competition with those whose rates and practices they were directed to regulate. It was considered more than questionable whether \$50,000,000 of tonnage could be secured by purchase for the government or whether ships could be constructed on favorable terms to the government in view of the demand from private corporations both at home and abroad. In its regulating provisions the Ship Board was authorized to prevent all the various irregularities found in ocean and Great Lakes commerce, many of which were duly enumerated and specifically forbidden. Power also was given to the board to investigate complaints by shippers or rival vessel owners. While parts of the act would require construction by the Supreme Court, yet confidence was expressed that it would serve to make uniform water transportation problems and stabilize freight rates. The members of the Shipping Board (q.v.) were not nominated by the President until late in the year, so that it was not organized for work.

**LA FOLLETTE SEAMEN'S ACT.** This measure, enacted March 4, 1915, was in effect in 1916, but conditions were so unusual that shipowners and ship captains complied with many of its provisions, while it was variously construed with the aim of facilitating commerce. There was, however, continued criticism which under more normal conditions unquestionably would have led to a call for its amendment. See SHIP-BUILDING.

**SHIPPING BOARD, UNITED STATES.** A board authorized by Congress in 1916, with powers of investigation, regulation, and rate fixing over United States marine business. The board may issue bonds not to exceed \$50,000,000 to build, purchase, or lease vessels for a merchant marine. It constitutes the head of a corporation which will endure for a period not to exceed five years after the war. The salary of board members was fixed at \$7500 annually. The personnel of the board was announced by President Wilson December 22nd as follows: William Denman, San Francisco admiralty lawyer, Democrat (six years); Bernard M. Baker, Baltimore shipowner, Democrat (five years); John A. Donald, New York steamship owner, Democrat (four years); John Barber White, Kansas City exporter, Republican (three years); and Theodore Brent, New Orleans transportation expert, Republican (two years).

**SHIP PURCHASE BILL.** See FINANCIAL REVIEW.

**SHIVELY, BENJAMIN FRANKLIN.** An American legislator, died in Washington, D. C., March 14, 1916. Born in St. Joseph County, Ind., in 1857, he studied at the Northern Indiana Normal School, then taught for some years and ran a

country newspaper. At 27 he was appointed to fill out an unexpired term in Congress, and from that time he was identified with Democratic politics. He held his seat in the House for consecutive terms until 1892, when he was not a candidate. Meanwhile, he had pursued law studies and had taken the degree of LL.B. at the University of Michigan (1888). As a lawyer at South Bend, Ind., Mr. Shively gained a leading position at the State bar. In 1903 and 1905 he received the complimentary Democratic vote for United States Senator, in 1908 he was elected to the Senate, and in 1914 was re-elected, this time by popular vote. For a time he was leader of his party in the upper house, and he retained a position of prominence, being chairman of the Committee on Pensions, ranking next to Senator Stone of Missouri on the Foreign Relations Committee, and exercising much influence in the Committee on Finance. Foreign affairs and the tariff were his chief interests. In 1914, when Senator Stone was ill, Mr. Shively, as acting chairman of the Committee on Foreign Relations, was entrusted with the Mexican difficulties of that period. He was president of the board of trustees of Indiana University. Thomas Taggart, Democratic Committeeman of Indiana, was appointed to serve as his senatorial successor until the election of 1916.

**SHOES.** See BOOTS AND SHOES.

**SHOOTING.** The national rifle shooting matches in 1916 were held near Jacksonville, Fla., the winners being as follows: Individual, W. H. Spencer, St. Louis, Mo., score 274; team, class A, National Trophy, U. S. Marine Corps, score 3047; class B, Hilton Trophy, New York National Guard, score 3037; class C, Marathon Trophy, California Civilian team, score 2964; pistol, George E. Cook, District of Columbia Civilian team, score 399; united service match, U. S. Marine Corps, score 4320.

The any-revolver championship was won by George Armstrong of San Francisco, Cal., with a score of 463, and the pocket revolver title went to Dr. J. H. Snook of Columbus, Ohio, who made a score of 209. In the target pistol contest George Armstrong was the victor with a score of 471.

The Interstate Association Trapshooting Tournament was held at St. Louis, Mo., the winners of the principal events being as follows: Grand American Handicap, J. F. Wulf of Milwaukee, Wis., with a score of 99 out of a possible 100; National Amateur, F. M. Troeh of Vancouver, Wash., with a score of 99 out of a possible 100. The professional championship was captured by P. R. Miller.

The Grand American Handicap went to J. F. Wulf.

**SIAM.** An independent kingdom in the southeast of Asia; a buffer state between British Burma and French Indo-China. Bangkok is the capital.

**AREA, POPULATION, ETC.** The total area is estimated at 600,000 square kilometers, or 198,900 square miles. Population (1910-11), 8,149,487. Persons in holy orders, 142,636. Births (1910-11), 162,491; deaths, 84,495. Immigration of Chinese coolies in 1912, 68,361, and emigration, 45,986; in 1911, 71,258 and 52,562; in 1910, 75,408 and 63,007. Siamese, Chinese, Malays, Cambodians, Mohns, Karens, Annamites, etc., make up the population. Foreign resi-

dents, about 2000. Bangkok has 628,675 inhabitants, of whom 197,918 Chinese.

Buddhism is the state religion, and the priests are in large measure in charge of educational matters. A new plan of education has been drawn up by the ministry of public instruction, and government-aided secular schools are being introduced. There are several missions.

**PRODUCTION.** Serfdom until recent years was the lot of a large part of the population, enslavement for debt being abolished only during the reign of Chulalongkorn. Partly for this reason agriculture is in a backward condition. Rice is the leading crop and the introduction of irrigation has greatly extended the available area. There are 26 rice mills (2 British, 2 German, 22 Chinese) in Bangkok. Next in importance after rice is the teak industry, carried on in the great northern forests mainly by British enterprise. Cattle and hides are exported.

Tin and wolfram are mined on a commercial scale. Gems have ceased to be an important product since the cession to the French of the Pailin district in 1907.

**COMMERCE AND COMMUNICATIONS.** A large proportion of the over-sea trade is with Great Britain; much of the trade passes through Singapore and Hongkong, though German and Norwegian shipping exceed British. The table below shows countries of origin and destination with the value of their trade for 1913-14 and 1914-15 in thousands of pounds sterling:

	Imports		Exports	
	1913-14	1914-15	1913-14	1914-15
United Kingdom..	1,500	1,058	447	1,088
China .....	673	662	26	16
British India .....	715	717	150	202
Germany .....	510	241	569	202
Singapore .....	1,190	1,127	3,486	3,520
Dutch Indies .....	207	208	92	181
Hongkong .....	1,114	1,157	171	54
Belgium .....	126	86	...	...
Other .....	...	...	...	...
Total .....	6,962	6,009	8,859	7,788

Vessels entered in the 1914-15 trade, 898, of 805,638 tons.

State railways (1912), 1024 kilometers, of which 213 kilometers local lines; private railways, 106 kilometers. During the fiscal year ended March 31, 1916, 105 miles of new line were constructed on the southern line of the Royal State Railways of Siam, making a total length of 495 miles open to traffic at the end of the year. The gross revenue amounted to \$564,779, showing an increase of \$73,560, or 15 per cent, over that of the preceding year, caused partly by increased receipts on the southern sections. Passengers yielded \$400,193 of the revenue and freight \$153,469. In the freight traffic of the line, as a whole, timber was the most important item, a position held by paddy the year before. It was expected that an additional section of the Siamese Northern Railway from Lampang to Pang-Hoa-Pong, a distance of 21 miles, would be ready for traffic by the end of 1916. This brings the line to the foot of a range of hills, where it will pass through the recently completed Koon Tan tunnel and on to Pang-Choom-Pu. At this point it was thought likely that construction might be delayed for a time, owing to the fact that there was not a sufficient supply of rails on hand due to war conditions in the steel markets of the world. It was proposed to

construct a road suitable for motor traffic from Pang-Choom-Pu to Lampoon, a distance of 24 miles; from the latter city to Chiengmai a good road being already in existence.

On the final completion of the line from Bangkok to Chiengmai it will be possible to cover the distance between these cities in 24 hours, a great advance on the one or two months required for the journey by boat.

Reigning king (Somdetch Phra Paramindr), Maha Vajiravudh, born Jan. 1, 1881.

**SIDGWICK, ETHEL.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, English.

**SIDNEY, SIR PHILIP.** See LITERATURE, ENGLISH AND AMERICAN, *History*, etc., English.

**SIENKIEWICZ, HENRYK.** A famous Polish novelist, died at Vevey, Switzerland, Nov. 16, 1916. He was born in Wola Okrzejska, Government of Siedlce, in 1846. The son of a Polish country squire, he was educated at the Realgymnasium at Warsaw, where he graduated, and later studied philosophy at the university of that city. After leaving the university he traveled extensively throughout his native country, learning thoroughly the history and condition of its people. His first literary efforts, published in 1872, were a sketch of a Kiev student life entitled *In Vain*, and a humorous story, *Nobody is a Prophet in his own Country*. He had witnessed the revolutionary struggle, including the terrible scenes in Warsaw in 1869, and was imbued with patriotic fervor. In 1876 he visited the United States, and his description of his American experiences in a series of letters in the *Polish Gazette* attracted much attention. His drama, *On a Card* (1879), dealing with the party struggles in Galicia, as well as his stories, *From the Note-Book of a Posen Teacher*, *Hanja*, and *Yanko the Musician*, added to his reputation. In 1880 he published *The Tatar Bondage*, a novel. The quick response to its patriotic appeal induced him to write the great trilogy *With Fire and Sword* (1884), *The Deluge* (1886), and *Pan Michael* (1888), novels dealing with the struggle of the Poles and Cossacks. In them his vivid descriptions of historical personages, while often inaccurate, stimulated the imagination of his readers and made a powerful impression. These were followed in 1890 by *Without Dogma*, a study in pathological psychology written in the form of a diary. *The Children of the Soil* (1894) is a novel of contemporary Polish manners. Up to this date his books, powerful though they were, had but a local and national appeal, but *Quo Vadis*, published in 1896, and repeatedly dramatized,—an epitome of Christian life and persecution in the reign of Nero—brought him world-wide fame. His *Knights of the Cross* (1904) takes the reader back to the time of the fierce struggles between the Poles and the Order of Teutonic Knights. Besides these works he wrote: *Life and Death and Other Legends and Stories* (1904); *On the Field of Glory* (1906); *In Life's Whirlpool* (1910); *In Desert and Woodland* (1911). In 1905 Sienkiewicz received the Nobel prize in literature. For many years he was the editor-in-chief of the periodical *Słowo*. His works have been translated into many European languages. During the past 30 years he had been the most widely known and attractive personality among the Polish people. After the outbreak of the European war he removed to Switzerland where he lived until his death. He

was very active in behalf of his suffering fellow-countrymen and was president of the General Relief Committee for Polish victims of the war. Greatly encouraged by the proclamation of the Russian Emperor in favor of a united and autonomous Poland, he predicted a bright future for his people after the war.

**SIERRA LEONE.** A British colony and protectorate on the west coast of Africa. Total area, 32,110 square miles; total estimated population, 1,327,560. Population of the Sierra Leone peninsula (1911), 75,318. Freetown (34,000 inhabitants) is the capital. The country is unhealthful and the inhabitants are averse to agriculture and other industries. Wild products constitute the bulk of the exports—kola nuts, palm kernels, palm oil, rubber, copal, and ginger. Imports 1914 were valued at £1,405,049; exports, £1,250,478. Revenue 1914, £675,689; expenditure, £680,146.

**SILESIA.** A crownland of Austria; area 1987 square miles; population, 1910, 756,949. Also a province of Prussia (see GERMANY, *Area and Population*).

**SILK.** The silk industry in 1916 reflected the two leading considerations in the industrial and commercial world, namely, the war in Europe and the great prosperity of the United States. While the war had its effect in reducing production and manufacturing in France and Italy and on the shipment of raw silk from the Levant and Asia Minor, yet there were gains in Japan and China, and the United States was able to absorb and manufacture the increased imports that came to her shores. So far as the American industry was concerned the year 1916 was a period of great prosperity, and the values of the raw materials and the finished product rose to new records. In March American manufacturers were forced to pay as much as \$5.57½ a pound for Sin-shiu No. 1 or tram stock and \$6.50 a pound for Kansai double extra crack chops or organ stock. Prices fluctuated during the year, with raw silk usually in good demand, and in November prices were tending again toward those of March. Record figures were also made for Italian, Canton, and China silks. On account of the war Europe was able to take only about one-half its customary supply from Japan, so an average of over 80 per cent of the exports from Yokohama went to the United States. In the 1916 season of a total of 199,800 bales 171,100 were shipped from Yokohama to the United States, a record only approached in 1914, when 142,900 bales out of a total of 200,400 came to America. These figures are significant, as but a few years earlier the total exports of Japan were only about 100,000 bales.

Shipments from Italy to the United States for the season ended June 30, 1916, were 10,945 bales as compared with 11,977 bales in 1915 and 8471 bales in 1913-14, the 1915 record being unusually heavy. During the season 1915-16 the imports of raw silk into the United States amounted to \$119,000,000, whereas in 1871-72 the figure was \$5,600,000. As regards quantities and sources the total importation of raw silk into the United States for the fiscal years 1914-15 and 1915-16 was as follows:

	1915-16		1914-15	
	Bales	Pounds	Bales	Pounds
From Italy and France . . . . .	12,490	2,760,000	12,650	2,790,000
From Japan . . . . .	171,100	28,100,000	180,600	17,630,000

	1915-16		1914-15	
	Bales	Pounds	Bales	Pounds
From Canton . . . . .	20,690	2,207,000	21,806	2,273,000
From Shanghai . . . . .	27,896	3,762,000	15,488	2,092,000
Tussah silk . . . . .	13,185	1,786,000	6,480	877,000
		33,615,000		25,662,000

There was an increase for 1915-16 of almost 8,000,000 pounds, or 31 per cent over the previous year, and a total never before equaled in the American silk industry. The major part of this gain was due to Japan, with 5,470,000 pounds, while Shanghai shared with 1,670,000 pounds apart from Tussah silks, which showed a gain of 909,000 pounds. The imports from Canton and from Europe slightly fell off, the former showing a loss of 66,000 pounds and the latter of 30,000 pounds.

In 1916 the new crop was estimated in the *American Silk Journal* as follows:

	1916	1915
	Kilos	Kilos
Europe: Italy . . . . .	3,800,000	against 2,880,000
France and other countries . . . . .	400,000	380,000
Levant and Asia Minor . . . . .	900,000	1,000,000
Asia: Japan . . . . .	18,000,000	12,000,000
Canton . . . . .	2,100,000	1,800,000
China . . . . .	4,000,000	4,350,000
India . . . . .	100,000	90,000
	24,800,000	22,500,000

This indicated an increase of about 8 per cent over the previous year. These statistics do not include the Tussah crop, which for the season 1915-16 furnished a total export of about 1,130,000 kilos, representing 18,800 bales. In comparison with the above figures the crop in Europe and export from the Asiatic countries in 1914-15 amounted to 21,200,000 kilos, whilst the result of 1913-14, the last normal season before the war, totaled 26,200,000 kilos.

In Italy the Piedmont crop showed an increase, but other districts were about the same as in the previous year, so that the crop was about 17 per cent below the average of the previous 10 years, and a marked improvement over that for 1915, which was 31 per cent below this average. In Japan the first crop, which usually is about 60 per cent of the total production, was 10 per cent above that of 1915 and in part already sold to American consumers. The Canton total crop was below the average, and that in China was less than in the previous year.

The hosiery industry in the United States was a large consumer of raw silk and in 1916 was in a flourishing condition. On the other hand the trade in ribbons was bad as there was a call for narrow widths. In broad silks there was active business throughout the year and with the demand of fashion for georgettes, taffetas, chiffons, and staple fabrics, other silk fabrics were active though the costs for dyeing, labor, throwing, etc., advanced continuously.

As further evidence of the prosperity of the silk industry it may be said that in 1916 there were more new mills constructed than were on record for any previous year. Of the 60 new plants built more than half were equipped to weave broad silks, the balance being divided among throwing mills, ribbon weaving plants, and miscellaneous work for winding and making braids and embroideries. Three quarters of the

new silk mills were in New Jersey and Pennsylvania, about 25 per cent of the total being in the city of Paterson.

While most of the new silk mills were small and unimportant, on the other hand several large concerns in the silk industry made important enlargements which surpassed most of the new mill projects.

#### See CHEMISTRY, INDUSTRIAL.

**SILVER.** The silver production of the United States in 1916, 72,883,748 fine ounces, showed a decrease of 2,077,327 ounces from 1915, a somewhat surprising circumstance in view of the increased production of base metals where silver is a by-product. The silver output of the United States for the years 1915 and 1916 is given in the accompanying table. A decline in production also occurred in Canada while Mexico's output went below even that of 1915. At the same time the price of silver went up and in May a record price of 77¼ cents was reached. The average for the year in New York in 1916 was 65.661 cents, with December the high month with an average of 75.765 cents. In 1915 the average price for the year was 49.684 as against 54.811 cents in 1914. The chief buying for the year was for coinage and the available supplies often were hardly sufficient to meet the demand, as everywhere apparently silver coins were in request. Thus in March Australia began to mint about \$2,500,000 of silver coins and this was followed by shipments from China to India for a similar purpose. Russia also sought silver for coinage, while it was reported that the French mint, which ordinarily issues silver coins to the extent of 8,000,000 to 10,000,000 francs, and Great Britain, which issued six times as much silver coinage in 1915 as on an average for 10 years, were heavy purchasers. In China not content with exports of silver coins the coins themselves and also copper coins were bought and in defiance of the law were melted for sale and export. There was such a shortage of silver in the Far East that during the latter half of 1916 there were exports of silver from San Francisco to the Far East. See METALLURGY.

#### SILVER OUTPUT OF THE UNITED STATES \*

	Silver: Fine Oz.	
	1915	1916
Alabama	.....	47
Alaska	1,054,634	1,426,303
Arizona	5,665,672	6,711,835
California	1,689,924	1,937,300
Colorado	7,199,745	7,771,479
Georgia	.....	141
Idaho	13,042,466	10,504,070
Illinois	.....	3,892
Maryland	.....	.....
Michigan	581,874	572,646
Missouri	55,534	52,000
Montana	14,423,173	14,750,964
Nevada	14,453,085	12,784,578
New Hampshire	.....	259
New Mexico	2,337,064	1,999,987
North Carolina	.....	429
Oklahoma	.....	386
Oregon	125,499	163,841
South Carolina	.....	32
South Dakota	197,569	212,805
Tennessee	99,171	103,400
Texas	724,580	689,465
Utah	13,073,471	12,965,715
Vermont	.....	150
Virginia	.....	2,049
Washington	213,877	4,851
Wyoming	.....	2,910
Continental United States	74,945,927	72,865,410

#### Silver: Fine Oz.

	Silver: Fine Oz.	
	1915	1916
Porto Rico	15,148	461
Philippines	.....	17,877
Totals	74,961,075	72,883,748

\* As reported by the Director of the United States Mint and the United States Geological Survey.

**SIMMONS COLLEGE.** A non-sectarian institution for the education of women in Boston, Mass. It was founded in 1899. In the fall of 1916 the student enrollment was divided as follows: Household economics, 393; secretarial studies, 336; library science, 124; general science, 726; social work, 94; industrial teaching, 7; and salesmanship, 40. There were 119 members in the faculty. Productive funds amounting to \$2,338,169 yielded an income in 1916 of \$86,002. The library contains 24,263 volumes. President, Henry Lefavour.

**SIMON, WILLIAM.** An American chemist, died at Eaglesmere, Pa., July 19, 1916. His home was at Catonsville, Md., near Baltimore. He was born in Germany, at Eberstadt, Hessen, in 1844, and from 1852 to 1860 studied at Giesesen. Then he removed to the United States, becoming chemist to the Baltimore Chrome Works, a position that he held till 1907. In 1871 he opened the first chemical laboratory for instruction to be established in Baltimore. For 30 years he also held a chair in the Maryland College of Pharmacy, from 1880 one in the College of Physicians and Surgeons, and from 1888 one in the Baltimore College of Dental Surgery. Professor Simon was the author of a *Manual of Chemistry*, first published in 1884, the 10th edition of which appeared in 1912. He received honorary degrees from the University of Pennsylvania and the College of Physicians and Surgeons, Baltimore.

**SIMPSON, SIR ALEXANDER RUSSELL.** A British obstetrician and gynecologist, died at Edinburgh, April 6, 1916. He was born at Bathgate, West Lothian, Scotland, in 1835, and was educated at Edinburgh University and abroad at the universities of Montpellier and Berlin. For seven years he was assistant to his uncle, Sir James Young Simpson, the discoverer of chloroform, and later practiced, for five years, in Glasgow. In 1870 he was appointed professor of midwifery and the diseases of women and children in Edinburgh University. Later he became dean of the faculty of medicine and emeritus professor in the same university, retiring in 1905. He was the author of *Contributions to Obstetrics and Gynecology*; with Dr. Berry Hart, *An Atlas of the Frozen Section of a Cadaver in the Genu-pectoral Position*; edited Sir James Young Simpson's *Lectures on the Diseases of Women*; and contributed many memoirs and papers to medical journals. In 1906 he was knighted.

**SINCLAIR, MAY.** See LITERATURE, ENGLISH AND AMERICAN, Fiction, English.

**SINGAPORE.** A division of the Straits Settlements (q.v.).

**SING SING PRISON.** See PENOLOGY.

**SINN FEIN.** See GREAT BRITAIN, History.

**SKATING.** The international outdoor championships in 1916 were held at Saranac Lake, N. Y., in February. Harry Cody of Toronto, Canada, carried off the honors with a total point score of 70. Anton O'Sicky of Cleveland, Ohio,

was second with 60. The winners of the principal races were: 220 yards, Lot Roe, Toronto, Canada; 400 yards, Ben O'Sicky, Cleveland, Ohio; one mile, Harry Cody, Toronto, Canada; two-mile, Arthur Staff, Chicago, Ill.; half mile, Ray McWhirter, Chicago, Ill.; three-mile, Carl Fisher, Milwaukee, Wis.; one-mile for boys of 16, Charles Jewtraw, Lake Placid, N. Y. Anton O'Sicky of Cleveland, Ohio, obtained the largest number of points in the indoor championships held at Pittsburgh, Pa.

Skating as a recreation continued to increase in popularity in the larger cities of the United States and many new rinks and "ice palaces" were opened to satisfy the demands of lovers of this sport.

**SKOULODIS, STEPHANOS.** See GREECE, *History*.

**SKYSCRAPERS.** See ARCHITECTURE.

**SLAVIC LANGUAGES.** See PHILOLOGY, MODERN.

**SLEEPER, ALBERT E.** Elected Republican Governor of Michigan Nov. 7, 1916.

**SLEET.** See METEOROLOGY.

**SLICER, THOMAS ROBERTS.** An American Unitarian clergyman, died in New York May 29, 1916. Born in Washington, D. C., in 1847, the son of the Rev. Henry Slicer, a Methodist minister who, for eight years, was chaplain of the United States Senate, and who, as presiding elder rode the Maryland circuit, he was educated at Baltimore City College, and for a decade was himself in the Methodist ministry, in Maryland, Colorado, and New York. Then he joined the Congregational Church, and became an associate of Henry Ward Beecher in Brooklyn, but soon he took a further step, and became a Unitarian in 1881. Afterward he held charges in Providence, R. I., and in Buffalo, N. Y., where he was prominent in civic life, and from 1897 to his death was minister of All Souls, in New York City. Dr. Slicer was prominent in various reform movements, and did much toward reducing race track and pool room gambling in the State. At one time he served as chairman of the National Commission on Prison Labor. Among his writings were: *The Great Affirmations of Religion* (1900); *The Way to Happiness* (1907); *From Poet to Premier: Centennial of 1909* (1909).

**SMALLEY, GEORGE WASHBURN.** An American newspaper correspondent, died in London April 4, 1916. He was born at Franklin, Mass., in 1833, and at 20 graduated from Yale, where he gained honors as a student and as an athlete. After studying law in the office of George F. Hoar, later United State Senator, and at Harvard Law School, Mr. Smalley was admitted to the bar in 1856 at Boston. At the opening of the Civil War, he was in the South, and having become known to the New York *Tribune* through a series of letters on negro life, he asked to be sent to the front. During the 11 months that he served as war correspondent, he made a remarkable record, gaining a famous "scoop" in his description of the battle of Antietam, in which encounter he served as an aid to General Hooker. Hooker highly praised his courage. From November, 1862, till 1867 he was a member of the editorial staff of the *Tribune*. In 1866, however, he had gone abroad to report the Austro-Prussian War, and in the next year he took charge, for his paper, of its London correspondence. In this post, which he

held till 1895, Mr. Smalley became noted as one of the most able and successful representatives of the press. Through his efforts Continental news reached the United States, by way of London, with greater dispatch than ever before; and responsibility for all important European correspondence of the *Tribune*, political, social, artistic, dramatic, and literary, rested with him. Particularly did his work as an organizer count during the Franco-Prussian War. Mr. Smalley was greatly appreciated in London, and his home came to be a meeting place for many of the most interesting people of the capital. To statesmen and politicians he commended himself especially by a never-failing discretion. For long he was a confidant of Gladstone. From 1895 to 1906 he again lived in the United States, as American correspondent of the *London Times*; then he retired and settled permanently in London. He published: *London Letters* (2 vols., 1890); *Studies of Men* (1895); *Life of Sir Sydney Waterlow, Bart.* (1909); *Anglo-American Memories* (1st series, 1911; 2nd series, 1912).

**SMITH, SIR CECIL CLEMENTI.** See CLEMENTI-SMITH.

**SMITH, CHARLES SOOY.** See SOOY SMITH, CHARLES.

**SMITH, SIR FREDERICK E.** See GREAT BRITAIN.

**SMITH, WILLIAM SOOY.** See SOOY SMITH, WILLIAM.

**SMITH COLLEGE.** A non-sectarian institution for the education of women at Northampton, Mass. It was founded in 1871. In the fall of 1916 there were 1917 students and the faculty numbered 159. During the year \$48,000 was received for the purchase of land and \$30,000 for a new professorship. The productive funds amounted to \$2,201,883 and the income to \$151,850. In the library were 60,000 volumes. President, Marion Le Roy Burton. See also UNIVERSITIES AND COLLEGES.

**SMITHSONIAN INSTITUTION.** In his report for the year ending June 30, 1916, Charles D. Walcott, secretary of the Institution, described for the benefit of the Board of Regents and the public, activities of the Institution proper and subsidiary agencies. A separate article will be found on the United States National Museum (including the National Gallery of Art and the Freer Art Gallery). The total permanent funds of the institution, when the report was made, amounted to \$1,048,134. The income for the year was \$107,670 and the disbursements \$105,125. The secretary, Mr. Walcott, made investigations in the Yellowstone Park and the Belt Mountains, collecting five tons of specimens which were shipped to the National Museum. Dr. E. O. Ulrich studied the lower Paleozoic deposits of the Mississippi Valley; Frank Springer explored two areas of Silurian rocks in the Ohio Valley for fossil echinoderms; and Dr. Edgar T. Wherry completed the areal mapping of various rocks in eastern Pennsylvania. From Celebes and Siberia were received large zoological collections. C. R. Shoemaker sent 5000 specimens of corals and other marine invertebrates from the Danish West Indies. Important botanical explorations of Brazil and Argentina were made by Dr. J. M. Rose. Under F. G. Cottrell, experts continued their efforts to clear fog by means of electrical precipitation. Prof. W. H. Holmes participated



in explorations made by the Carnegie Institution of Ancient Maya cities in Guatemala and Honduras. Prof. Anders Angeström reported on studies of nocturnal radiation made in Algeria, California, and in the Far North during the Arctic night.

The secretary of the Smithsonian Institution was appointed one of the vice-chairmen of the National Research Council, organized to further national preparedness. The *Smithsonian Annual Report* for 1915 contains in an appendix 22 papers on scientific progress, including: "The Utilization of Solar Energy," "Evidences of Primitive Life," "Heredity," and "Recent Developments in Telephony and Telegraphy." In 1916 the library of the institution contained more than 600,000 bound volumes and pamphlets. During the year 13,000 titles were added. Two important events were the second Pan-American Scientific Congress, on which a separate article will be found, and the Nineteenth International Congress of Americanists (December 27-31, 1915) attended by representatives of Austria, Chile, Cuba, Germany, Great Britain, Greece, Guatemala, Nicaragua, Peru, Russia, Sweden, and Uruguay, and by about 100 delegates from foreign and American learned societies and universities. John W. Foster, ex-Secretary of State, served as president of the congress. About 100 papers were presented on subjects relating to somatology, archaeology, ethnology, folklore, history, and linguistics. The Smithsonian Institution was represented by numerous exhibits at the Panama-Pacific and Panama-California expositions, receiving at the former a grand prize for the collective exhibit, and another grand prize also for the balloon pyrheliometer designed and exhibited by the Astrophysical Observatory. This is an instrument for measuring the heat of the sun by which records have been obtained at heights of over nine miles. For the activities of the Bureau of American Ethnology, see the article ANTHROPOLOGY. The International Exchange Service handled during the year 301,625 packages of governmental and other documents. The National Zoological Park reported more than 1,000,000 visitors in 1915-16. The United States Bureau of the International Catalogue of Scientific Literature published, as it has annually since 1901, a volume of references to scientific literature for each of 17 branches of science. The total references now number 369,509. In 1916 the Smithsonian Institution lost by death Dr. James B. Angell, who had been a member of the Board of Regents from 1877 to 1912. During the year James T. Lloyd, Congressman from Missouri, was appointed to the board.

**SNAITH, J. C.** See LITERATURE, ENGLISH AND AMERICAN, Fiction, English.

**SNUFF.** See TOBACCO.

**SNUFF POISONING.** Since 1914 25 cases of snuff poisoning have been observed at the Mayo Clinic. The use of "Copenhagen" snuff, according to Crispin, produces the most deleterious effects. The symptoms of excessive snuff taking are chronic headaches, indigestion, irritable heart action, shortness of breath, and impairment of the mental faculties even to the point of degeneracy. In some of the worst cases delusions and hallucinations occur. Crispin observes that the chronic snuff habitué does not seek medical aid for the cure of his habit, but because of impaired organic function. These

snuff chewers show ulceration and scarring of the mucous membrane of the mouth which possibly may later be the source of malignant growths.

**SOCCER.** See FOOTBALL.

**SOCIAL DEMOCRATIC PARTY.** See GERMANY, History.

**SOCIAL ECONOMICS.** During recent years it has become usual to speak of problems relating to the betterment of the condition of labor and the achievement of a more perfect distribution of wealth under the treatment of social economics. While economics has come to relate more specifically to problems of production and to theoretical analyses of value and of rates of wages and interest, social economics deals more specifically with the injurious effects of certain conditions of labor, such as low wages, long hours, night work of women, the employment of children at early ages or in trades dangerous to health or morals, and with proposals for increasing the welfare and intelligence of the social group by social legislation, an increased regulation of economic life and an enlargement of the opportunities of the less fortunate members of society. Fundamentally social economics seeks to centre attention not so much on the volume of exports or imports, the volume of trade or quantity of production, but upon problems of perfecting individual and social life. It lays stress upon the investigation of economic conditions with a view to discussing their causes and consequences, and it emphasizes education and legislation. Matter relating to this field will be found under the following headings: CHILD LABOR; LABOR; LABOR LEGISLATION; MINIMUM WAGE; OCCUPATIONAL DISEASES; OLD-AGE PENSIONS; PENSIONS FOR MOTHERS; PROSTITUTION; WOMEN IN INDUSTRY; and WORKMEN'S COMPENSATION.

**Bibliography.** Woods Hutchinson, *Community Hygiene*; R. Crawford, *The Immigrant in St. Louis. A Survey*, being the second study issued by the Missouri School of Social Economy; H. Gebhard, *Coöperation in Finland*; R. H. Hutchinson, *The "Socialism" of New Zealand*; E. T. Devine, *Pauperism: An Analysis*, being No. 9 in Studies in Social Work issued in pamphlet form by the New York School of Philanthropy; C. S. Loch, *Charity and Social Life*; R. W. Sellars, *The Next Step in Democracy*; W. A. Bonger, *Criminality and Economic Conditions*, translated from French by H. P. Horton; S. P. Breckenridge and Edith Abbott, *The Delinquent Child and the Home*; M. F. Crow, *The American Country Girl*; E. T. Devine and Mary Van Kleeck, *Positions in Social Work*; E. B. Gowin and W. A. Wheatley, *Occupations, a Textbook in Vocational Guidance*; E. Smith, *Wage-earning Women and Their Dependents*; E. T. Towne, *Social Problems. A Study of Present-Day Social Conditions.*

**SOCIAL HYGIENE, BUREAU OF.** The Bureau of Social Hygiene was established by John D. Rockefeller, Jr., in New York in 1911 for "the study, amelioration, and presentation of those social conditions, crimes, and diseases which adversely affect the well-being of society, with special reference to prostitution and the evils associated therewith." Its first study was "Commercialized Prostitution in New York City" by George J. Kneeland (1912); and one of its first innovations was the establishment of a Laboratory of Social Hygiene in connection with the New York State Reformatory at Bedford

Hills, under the direction of Dr. Katherine B. Davis. In 1914 it issued *Prostitution in Europe*, by Abraham Flexner, giving a survey of the system in various countries. Mr. Flexner drew the conclusion that the established systems of regulation, segregation, and medical examinations are not only farcical but in all probability worse than useless. Its next study was conducted by Mr. Raymond B. Fosdick into the police systems of London, Berlin, Paris, Vienna, and other European cities, issued under the title *European Police Systems* (1915). This showed the immense superiority of European cities in the maintenance of integrity and efficiency and higher regard for the technical and professional character of police service in contrast to American inefficiency and irresponsibility. In 1915 was completed a second survey of "Commercialized Prostitution in New York City," giving comparisons with 1912. This indicated that under the administration of Mayor Mitchel and Commissioner Woods many of "the commercialized aspects, such as the sale of liquor, sale of clothes to inmates at exorbitant prices, the promiscuous and open methods of advertising and stimulating the trade, the excessive charges to inmates for board, the buying and selling of shares in houses, the activity of real estate agents in renting houses for immoral purposes at advanced rentals, the long hours of service demanded of inmates, and other features of exploitation have been practically eliminated." As the result of a further similar inquiry in 1916 the bureau reported that organized vice in New York had become "furtive, disorganized, precarious, unsuccessful"; and again chief credit was given to the Mayor and the Police Commissioner. During 1916 the bureau was conducting an examination into the police organizations and methods of American cities and the preparation of a report on prostitution in the United States. See also PROSTITUTION.

**SOCIAL HYGIENE ASSOCIATION, AMERICAN.** See PROSTITUTION.

**SOCIAL INSURANCE.** During the last six or eight years there has been a rather remarkable development of the idea that the community should take action to provide resources to meet the usual exigencies of industrial life. Social insurance was defined by Mr. Arthur Hunter in a November address before the Actuarial Society as "an endeavor to give a measure of social justice through assumption by the community of the burden of the loss which the individual sustains through accident, death, sickness, invalidity, unemployment, and old age." While the more well-to-do members of society suffer no loss of social position from such contingencies, these are all frequent causes of poverty, crime, and the perpetuation of ignorance and low standards of living among the working class. It is now widely recognized that the evil effects of these handicaps may be counteracted in large part by the application of the principle of insurance. Germany introduced such plans relating to sickness, invalidity, and old age in the eighties, but only in the last few years have practical steps been taken in England, Australasia, and America. In the United States the first line of attack was upon industrial accidents, (see WORKMEN'S COMPENSATION); of a similar nature has been the movement to protect workers from the evils of occupational diseases (q.v.). There has likewise been some agitation, but as yet in this country very

little in the way of practical effort, to combat the evils of unemployment (q.v.); while old-age pensions (q.v.) have thus far been provided in the United States only by private corporations or by governments for their own employees. The last three years, however, have seen the beginnings of serious agitation for the introduction of insurance against sickness and invalidity. For results of a public health survey, see WELFARE WORK.

The first definite step toward public health insurance in the United States was taken by the American Association for Labor Legislation in December, 1912, by the creation of a Social Insurance Committee. The object of this committee was to study plans of such insurance, to prepare proposed laws, and to stimulate discussion. It held a conference on the subject in 1913, drew up standards for legislation in 1914, and in 1915 drafted a law which was submitted to the legislatures of Massachusetts, New Jersey, and New York. Investigating commissions were established in California and Massachusetts to report in January, 1917. Moreover, a bill was introduced early in 1916 by the Socialist Congressman, Meyer London, providing for a commission to study social insurance in all its aspects. American experience with sickness insurance has been limited to a few voluntary schemes inaugurated by employers, to trade union funds, to a few workmen's benefit societies, and the fraternal orders. Commercial insurance companies have built up an enormous business insuring wage earners and their families for small death benefits. Such companies now reach nearly 25,000,000 insured persons, from whom they collect \$200,000,000 per year, of which \$80,000,000 is absorbed in administrative expenses. Not only is such insurance therefore extremely expensive, but it almost entirely fails to meet the contingencies for which sickness or health insurance is designed. In view of such facts and the agitation of the past few years the American Association of Manufacturers strongly approved the principle of compulsory health insurance. The attitude of organized labor toward such insurance has been either non-committal or slightly hostile owing to general opposition to the principle of compulsion. It is feared by labor leaders that health insurance might result in compulsory medical examinations, which would result in rejection of workmen below the standard. Moreover, those unions that maintain health benefits fear the disorganization of that feature of their activities.

**HEALTH INSURANCE STANDARDS.** The above mentioned standards of the American Association included the following: (1) Compulsory insurance with joint contributions from employer, employee, and the State; (2) all wage-earners receiving less than a fixed annual sum and regularly employed should be included in the compulsory plan, as usual, also casual and home workers so far as practicable; (3) a voluntary system should be provided for other wage-earners and other persons; (4) health insurance should cover a period of 26 weeks, but should be supplemented by invalidity insurance; (5) insurance funds should be mutual and local, or organized in large cities by trades with a federated bureau for medical relief; (6) invalidity insurance should be carried by funds covering a larger geographical area, but administered in close cooperation with local health funds; (7) both

health and invalidity insurance should include adequate medical service, supplies, nursing, and hospital care; (8) in addition cash benefits should be provided by both health and invalidity funds; and (9) such insurance should lead to a campaign of health preservation.

**PROPOSED LAW.** The following are the main features of the model law drawn up by the Committee on Social Insurance of the American Association for Labor Legislation. The experience of Great Britain showed that the better paid workers were very generally insured in voluntary friendly societies, but that the principle of compulsion must be adopted in order to secure the insurance of the more poorly paid. Moreover, compulsion reduced the administrative cost to 14 per cent of the receipts as compared with 37 per cent for societies collecting small premiums from house to house. Insurance embracing all workers, moreover, would avoid the necessity of a large reserve fund since every age group is continually recruited from lower ages. Consequently this law provided for the compulsory insurance of all persons employed at manual labor and all other employees receiving not more than \$100 a month. The law provides for an administrative body known as the Social Insurance Commission which is given authority to make special regulations for the insurance of home workers and casual employees. Benefits are provided for insured members for any sickness or accident or death not covered by workmen's compensation. Benefits include medical, nursing, and surgical attendance; medicines and surgical supplies; a cash benefit equal to one-third of the wages of the insured member while in a hospital; a weekly maternity benefit for insured women for a period of eight weeks, of which at least six must be subsequent to delivery; a funeral benefit not to exceed \$50; and medical and surgical attendance and medicines for dependent members of the families of the insured persons. Experience has shown that a difficult feature of health insurance is the regulation of the medical service. The act provides for a free choice of the following methods: (1) a panel of qualified physicians may be made up from whom the patient may have a free choice subject to the physician's right to refuse any specified call, and provided that no physician may have on his list of insured patients more than 500 families nor 1000 persons; (2) the insurance funds may maintain a number of salaried physicians with a reasonable freedom of choice for the insured; (3) the fund may maintain district medical officers for the treatment of all insured persons in prescribed areas; or (4) there may be a combination of the above methods. The purpose of limiting the number of insured patients is to prevent a repetition of English experience whereby in many communities a few physicians treated more than half of the insured population. The method of paying physicians so much per person per year, as is frequently done in fraternal organizations, has the defect of frequently leading to hurried negligent attendance. The salaried physician such as now employed by various railroads frequently prevents freedom of choice by the patient. The method of a stipulated payment per visit has been preferred by the medical profession and also secures for the patient more careful attention, but it imposes a heavier burden upon the insurance funds. It is believed that a combination of these methods may prove most satisfactory.

The act provides that employers and employees shall make equal contributions to the funds and that the State shall contribute one-fifth of the total. But it is stipulated that "if the earnings of the insured fall below \$9 a week" the share of the employer shall, as wages decrease from \$9, gradually increase from 40 to 80 per cent of the total, the share of the employee shall decrease from 40 to 0 per cent of the total, and the share of the State shall remain constant at 20 per cent. The act also provides that where several industries are included under the same fund, allowance shall be made for the sickness experience in different industries. This provision is designed to encourage sanitary precautions by employers.

There are three ways in which the insurance may be carried: a State fund, approved societies as in England, or district mutual associations as in Germany. Where the second plan is adopted it must be supplemented by a State organization in order to compel the compliance of persons not joining such an organization; but where the State fund or the district mutual associations are in vogue provision must be made for voluntary societies. The objections to a State fund are that its large size, the number of its officials, and its wide scope make it cumbersome, and open opportunities for favoritism either of industries, of individual plants, of localities, of insured persons, or of physicians. Moreover, it does not stimulate local pride nor enlist the intimate interest of either employer or employee. On the other hand, it makes possible the accumulation of wider experience, the exertion of powerful pressure on backward communities, greater ease in suppressing local contagions, better legislation, easier exercise of police power, and more complete standardization. The act provides that an approved society may be a labor union, benevolent or fraternal society, or a society especially organized for the purpose; none of these may be carried on for profit, all must be under the absolute control of their insured members, in sound financial condition, grant at least the minimum benefits provided in the act, have at least 500 insured members, and not endanger the existence of any local or trade fund. The act also provides that 10 per cent of the State contributions shall be paid into a fund known as the Guarantee Fund which shall be used to meet extraordinary losses such as those due to floods or epidemics. The act would create a State social insurance commission of three persons appointed by the Governor and having general oversight of the health insurance for the entire State. In addition there should be created a social insurance council of 12 members, 6 chosen by employer directors of local funds and 6 by employee directors of local funds.

**CONFERENCE ON SOCIAL INSURANCE.** Under the auspices of the International Association of Industrial Accident Boards and Commissions a conference on various branches of social insurance was held in Washington, D. C., December 5th to 9th. Two days' sessions were devoted to workmen's compensation, special attention being given to the merits and demerits of different forms of administration, the different methods of carrying such insurance, schedules of awards and lump sum settlements, rate-making, accident prevention, medical services, physical examinations, occupational diseases, and the special problems of the permanently disabled workers. The third

day was devoted entirely to sickness (health) benefits and insurance; present methods of providing such insurance through group insurance, trade unions, mutual benefit funds, and establishment funds of corporations, such as those of the International Harvester Company and the Pennsylvania Railroad Company, were discussed. In addition the main features of the proposed health insurance legislation were considered and special attention was given to sickness insurance for women and problems of medical services and benefits. Other features of social insurance discussed were: invalidity and old-age insurance; pensions and retirement allowances; maternity benefits and mothers' pensions; unemployment insurance; and savings banks and other forms of industrial insurance. The organization calling this conference is composed of official bodies responsible for the administration of compensation laws in the United States and Canada. Its secretary-treasurer is Royal Meeker, United States Commissioner of Labor Statistics, who is also chairman of its special committee on social insurance. The proceedings will be published as a special bulletin of the Bureau of Labor Statistics.

**SOCIALISM.** Efforts to restore an international organization continued throughout the year, but without success. After the outbreak of the war the central body of international socialism, that is to say, the International Socialist Bureau, with headquarters at Brussels, ceased its activities. Its chairman, the Belgian Socialist Emile Vandervelde, joined the Belgian defense ministry and the headquarters of the bureau were removed to The Hague, where it was under the direction of the Dutch Socialists. On July 30th and August 1st and 2nd a conference of neutral Socialists affiliated with the International Bureau, was held at The Hague, representing Denmark, the Netherlands, Sweden, the United States, and Argentina, and resolutions were passed laying the blame for the war on the capitalist system, advocating free trade, freedom of the seas, and democratic decentralization of power, and condemning proposals for a trade war after the war. As to the Socialists in the belligerent countries, they remained bound for the most part by their national ties. In September, 1915, the Zimmermann (Switzerland) conference, as noted in the preceding YEAR BOOK, had called together, for the first time since the war began, representatives from the fighting nations. A reunion of these representatives was held at Kienthal, Switzerland, April 24-30, 1916. Forty delegates were present, consisting mainly of the Italian official Socialists, who remained hostile to the war, and of Swiss and Russian Socialists. There were two German representatives, of whom one was editor of *Vorwärts*, and three French representatives, MM. Brizon, Blanc, and Raffin-Dugens.

Among the French Socialists such efforts for international unity met at first with little favor. At the Christmas congress of 1915 the Unified Socialists had repudiated the Zimmermann programme and the German terms of peace by a vote of 2736 against 76. But as time passed the minority gained strength, and at the meeting of the National Council on April 9th it had risen to about one-third. The proposal to renew the international organization, disrupted by the war, for the discussion of the terms of peace, and to admit thereto the German delegates was re-

jected by only 1996 against 960. The committee of the International Bureau at The Hague under the Dutch Socialist leader, M. Huysmans, had endeavored to bring this about. The Germans were ready to accept, but the Socialists of France, Great Britain, and Belgium refused. The Zimmermann-Kienthal element objected to making this measure conditional upon the consent of those three countries, thus shutting out the 27 other sections. They argued that the war was the result of the greed of the capitalist class and that all nations were equally guilty. On the other hand, representatives of the majority, for example, MM. Albert Thomas, Sembat, Renaudel, and Dubreilh, all declared energetically for national defense. In June the three Kienthal delegates voted in the Chamber against the war credit. At the next meeting of the National Council there was some further evidence of increased strength of the minority. There was also an accession to the minority element throughout the country, and entire federations in several of the departments and cities expressed the minority view. In the congress at Paris held at the close of the year, a resolution was passed calling upon the government to pursue a more vigorous policy, both military and civil, in the conduct of the war and to draw upon all the resources of the nation in order to insure the earliest possible conclusion. The Kienthal delegate offered a motion for the resumption of international relation between Socialists of all nations. This was defeated after a long debate and by only a small majority.

In Germany the division in the Social Democratic ranks, noted already in the preceding YEAR BOOK, led finally to a rupture. On Dec. 22, 1915, the minority had protested against any schemes for annexation or conquest, and in the vote of credit there were 20 opposed to the government, out of the 110 deputies—24 not voting. In January, 1916, 10 Socialist deputies in the Landtag expressed minority views, demanding the restoration of Belgium and declaring that the prolongation of the war would exasperate the working classes. In the Reichstag the crisis was reached on March 24th just after the Finance Minister's announcement of the success of the last loan, and his congratulatory remark that harmony prevailed throughout the country. Herr Haase, successor to Bebel and former president of the party in the Reichstag, declared that the Socialists detested the war as due to the greed of German capitalists aiming at world domination, and that in spite of military successes, nothing had really been gained. He believed the people longed for peace and were weary of the useless massacres. Great indignation was expressed by members of the majority, who emphatically declared their fidelity to the government, and Haase was expelled by a vote of 58 to 33, 7 not voting. The dissident group assumed the name of the Socialist Union of Labor. Nevertheless, the gain of the minority was not large, having risen from 14 at the beginning of the war to only 18 or 20, and it appeared to be offset to a certain extent by a closer union between the loyal majority and the government. For further details, including the case of Liebknecht, see GERMANY, paragraphs on *History*.

In Great Britain there was a split in the British Socialist party at its annual meeting in March, when the majority, having voted for se-

cret sessions, a considerable body, including Messrs. H. M. Hyndman and Dan Irving, withdrew, protesting against this action, and characterized the majority's programme as one of pernicious anti-national pacifism. The majority conference at which about 150 delegates were present declared the working classes were opposed to the war and in favor of immediate peace on the basis of freedom and autonomy for all nations and no territorial annexations. In Finland after June, 1916, the Socialists held the absolute majority in Parliament, having 103 out of the 200 seats. See ITALY and FRANCE, paragraphs on *History*.

For Socialism in the United States, see article UNITED STATES, *Presidential Campaign*.

**SOCIAL PSYCHOLOGY.** See PSYCHOLOGY, section so entitled.

**SOCIETIES.** Articles on societies will be found alphabetized under some characteristic word of the title.

**SOCIOLOGICAL CONGRESS, SOUTHERN.** See SOCIOLOGY.

**SOCIOLOGICAL SOCIETY, AMERICAN.** See SOCIOLOGY.

**SOCIOLOGY.** Other matters of sociological interest than those noted below will be found under SOCIAL ECONOMICS and the references given there; POLITICAL ECONOMY, and the list of cross references and bibliographies there noted; CHARITIES; LABOR; PENOLOGY; PROSTITUTION; and RELIEF FOR WAR VICTIMS.

**AMERICAN SOCIOLOGICAL SOCIETY.** This body held its 11th annual meeting at Columbus, Ohio, December 27th-29th. The general subject was "The Sociology of Rural Life." Its first session was held jointly with other scientific bodies, for which see POLITICAL ECONOMY. Among the addresses given at the various subsequent sessions were the following: "City versus Country" by Rev. Warren H. Wilson, of the Presbyterian Board of Home Missions; "Folk Depletion as a Cause of Rural Decline," by Prof. Edward A. Ross, University of Wisconsin; "The Non-Partisan League," by Charles E. Russell, editor of *Pearson's Magazine*; "The Mind of the Farmer," by Prof. E. R. Groves, New Hampshire College; "Social Control: Personal Ideals of Country Boys and Girls," by Prof. Mary E. Sweeney, University of Kentucky; "The Development of Rural Leadership," by Prof. G. Walter Fiske, Oberlin College; "Social Aspects of American Land Problems," by Prof. Paul L. Vogt, Ohio State University; "Rural Credits Law," by Dr. C. W. Thompson, United States Bureau of Rural Organization; "The Consolidated School as a Community Centre," by Rev. C. O. Gill, Secretary of the Commission on Church and Country Life; "Coöperation and the Community Spirit," by Prof. A. D. Wilson, University of Minnesota; "Rural Surveys," by Dr. C. W. Thompson; and "The Scope and Methods of Instruction in Rural Sociology," by Prof. John M. Gillette, University of North Dakota.

**SOUTHERN SOCIOLOGICAL CONGRESS** held its fifth annual meeting at New Orleans April 12th-16th. "For health, justice, and coöperation" was the slogan of the meeting, and furnished the chief topics of discussion. About 600 delegates and social workers were present. For the last two years, health has been the chief interest of the conference, but the plan of work for the next few years includes sections on Home; Church and Social Service; Education and Ad-

ministration of Law; Industrial Relations and Temperance; Race Relations and Juvenile Life; Country and City. Health campaigns and social surveys are planned in 10 small cities in as many different States for the coming year. A further new feature of the congress is a monthly bulletin of its work.

One of the most interesting speeches of the conference was one on lynching given by U. D. Weatherford, field executive secretary of Robert E. Lee Hall of the Blue Ridge Association. Mr. Weatherford stated that there had been no appreciable diminution in lynching in the South since 1879 when the return to stable government was made. He gave statistics showing that between 1882 and 1903 there were 3337 lynchings of which 2060 were negroes, 1169 native whites, and 108 foreign whites. Only 34 per cent of the lynchings of the colored men were for assault on white women. As means of ridding the South of the mob or lynching spirit, Mr. Weatherford suggested prompt and just court procedure against criminals; campaign against white men who seduce negro girls; preaching by negro leaders against negroes guilty of assault; union of white and colored to bring every offender to justice; teaching the younger generation to respect the law and to regard personality as sacred. Extension conferences of the congress were arranged for at Winston-Salem, N. C., September 19th; Farmville, Va., September 26th; and Bristol, Tenn., October 3rd. C. H. Brough, Governor-elect of Arkansas, was made president of the congress for 1917.

**Bibliography.** Among the year's books may be mentioned the following: E. W. Burgess, *The Function of Socialization in Social Evolution*; E. T. Towne, *Social Problems*; A. O. Taylor, *Persistent Public Problems*; A. B. Wolfe, *Readings in Social Problems*; G. W. Nasmyth, *Social Progress and the Darwinian Theory*; A. Christensen, *Politics and Crowd-Morality*; W. Trotter, *Instincts of the Herd in Peace and War*; L. F. Post, *Ethics of Democracy*; Edwin A. Kirkpatrick, *Fundamentals of Sociology*—a text by a psychologist and educator for special use in normal schools; John M. Gillette, *Sociology*—a very elementary treatise in the National Social Science Series published by A. C. McClurg & Co.; R. W. Sellars, *The Next Step in Democracy*—a stimulating work written from the viewpoint of philosophical socialism; J. A. Bigham (Ed.), *Select Discussions of Race Problems. A Collection of Papers of Especial Use in the Study of Negro American Problems*; L. M. Bristol, *Social Adaptation. A study in the development of the doctrine of adaptation as a theory of social progress*; H. K. Rowe, *Society, Its Origin and Development*; Sidney Webb, *Towards Social Democracy?*; Hutton Webster, *Rest Days*; George W. Crile, *Man—An Adaptive Mechanism*; G. O. Ferguson, *The Psychology of the Negro*; W. S. Fox, *The Mythology of All Races. In 13 volumes. Vol. i, Greek and Roman*; Patrick Geddes, *Cities in Evolution*; Frederic C. Howe, *Why War?*; H. G. Wells, *What is Coming?*; L. T. Hobhouse, *The Question of War and Peace*; Frederic C. Howe, *Socialized Germany*; H. W. Kellogg, *Military Selection and Race Deterioration*; John Koren, *Alcohol and Society*; Edward Krehbiel, *Nationalism, War, and Society*; Julius Hecker, *Russian Sociology. A Contribution to the History of Sociological Thought and Theory (1915)*; Willystine Goodsell, *A History of the*

*Family as a Social and Educational Institution.*

*Population.* F. J. Warne, *The Tide of Immigration*; Lillian Brandt, *Facts About the Death-rate*; A. O. Fonkalsrud, *The Scandinavian-American*; Charles Gide, *De la Reconstitution de la Population Française*; F. L. Hoffman, *The Mortality from Cancer Throughout the World; Declining Birth-rate; Its Causes and Effects. Being the report of and the chief evidence taken by the National Birth-rate Commission*; Lillian Brandt, *Facts About Tuberculosis.*

**SODIUM.** See CHEMISTRY, INDUSTRIAL.

**SOILS.** Agricultural conditions created by the European war accentuated as never before the necessity for conservation and intensive utilization of soil and fertilizer resources. Under such conditions a high level of production must be maintained with a relative shortage of certain kinds and high prices of all kinds of fertilizers. As a result there was a marked tendency to bring under cultivation lands which had not been exhausted by previous or continuous culture and to adopt methods of management which utilized more fully the accumulated fertility of soils which had been under intensive fertilization in past years. This emphasized the importance of a better knowledge of the possibilities and crop adaptations of soils and of the best practical means of supplementing the soil fertility. This meant greater use of the results of scientific investigation for the practical purpose of maintaining and increasing the productivity of the soil, an outstanding feature of the present agricultural situation, especially in Germany but also in other European countries as well as in the United States. European countries, however, had not been able to continue, under the abnormal conditions prevailing, the systematic scientific studies of soils pursued in previous years. They had rather been obliged to draw upon the reserves of scientific information furnished by these previous investigations. Therefore, while the practical applications of the results of such investigations were being more largely used in soil management than ever before, the more scientific work had practically been at a standstill in many countries.

In the United States, on the other hand, soil investigation as well as the practical application of scientific knowledge to soil management were very active during the past year. The systematic survey of the agricultural lands of the United States by the Bureau of Soils of the United States Department of Agriculture, cooperating with several of the State agricultural experiment stations, geological surveys, and departments of agriculture, which is so fundamentally necessary to the intelligent and profitable utilization of the soils in crop production, continued to be actively prosecuted. During the fiscal year ended June 30, 1916, detailed soil survey work was carried on on 75 different areas in 32 States. The total area covered by detailed surveys was 38,671 square miles or 24,749,400 acres. Reconnaissance surveys were made in two States and covered 8334 square miles. The total area which had been covered by detailed surveys up to the date named was 408,600 square miles or 261,504,000 acres, and by reconnaissance surveys 484,312 square miles or 309,959,680 acres. Typical soil areas in every State had been surveyed and an adequate basis had been laid for a more thorough and intensive study of the rela-

tion and better adaptation of the soils to crops. During 1915 and 1916 such a study of trucking soils was in progress, and a report on the trucking soils of certain typical areas in New Jersey was made. A similar study of soils in the vicinity of Norfolk, Virginia, was in progress.

As already intimated, a great impetus was given since the European war began to a comprehensive educational campaign with a view of increasing the output of agricultural products. In the European countries the purpose of this had been to increase the yield from the present acreage rather than to increase the area under crop. In the United States and countries similarly situated as regards lands available for culture, the more important consideration had been to increase the products per man. One of the most important and influential agencies engaged in this educational work in the United States was the system of cooperative extension maintained by the State agricultural colleges and the United States Department of Agriculture working especially through the county agents in about 1300 agricultural counties. These agents were actively teaching farmers by word of mouth, demonstration, and printed matter better methods of soil management. They recognized that the maintenance of soil fertility was a universal problem and fundamental to permanent agricultural prosperity, and had given it a large place in their programme for improved and permanent agriculture. They were attacking the problem of soil improvement from almost every angle to meet local conditions. Special emphasis was being placed on the need of lime and humus because these had been found to be two of the most important and widespread needs of the soils of the United States.

The question of soil acidity and the best means of overcoming it occupied a large place in recent investigations on soils. Some progress was made in determining the nature of soil acidity, namely, that it could not be accounted for by colloid absorption phenomena, but is largely, if not exclusively, due to the actual presence of true acids (mineral and organic), acid silicates, etc.; in other words, that it was due to an excess of hydrogen ions and was probably susceptible of accurate measurement by electrical and other methods. Experiments were reported which indicated that the acidity of soils is not increased by continued use of acid phosphate, but may be increased by the formation of acid iron and aluminum compounds by the continued application of ammonium sulphate.

The subject of soil toxicity, so closely associated with that of acidity, also received considerable attention. Investigations were reported which showed that many of the substances which had been shown to be highly toxic to plants in water cultures were either non-toxic or ultimately favorable to plant growth in soils even when used in large amounts.

Further light was thrown on the use of sterilization as a means of correcting unfavorable conditions in soils, confirming the previous conclusion that this method of soil treatment has practical value, particularly in connection with greenhouse soils. If not properly done, however, the process may produce toxic substances in the soil.

Some progress was made in the bacteriological study of soils, although investigations were re-

ported which cast doubt upon the reliability of certain conventional and widely used methods as means of judging of the progress, rate, and extent of bacteriological changes in the soil, such as ammonification and nitrification. On the other hand, investigations were reported which indicated that laboratory tests of such bacterial activities may show quite accurately the relative crop-producing power of soils. The stimulating effect of manure and of small amounts of arsenic on these bacterial activities was shown in investigations reported during the year. See also FERTILIZERS.

**Bibliography.** A new American periodical, *Soil Science*, devoted entirely to soil investigation, was started during the year. A new edition of that most complete compilation of data of fundamental importance in the study of soils, *Data of Geochemistry*, by F. W. Clarke (U. S. Geological Survey *Bulletin 616*), was issued during the year. Among the books that appeared were *The Spirit of the Soil*, by G. D. Knox (London, 1916), and a revised edition of *Le Sol et les Labours*, by P. Difiloth (Paris, 1916).

**SOLDIER'S HEART.** "The irritable heart of soldiers," was noted by American physicians during the Civil War. A similar phenomenon is now described as a frequent cause of disability among the fighting forces in the great European war. The important symptoms are a feeling of exhaustion, breathlessness on slight exertion, pain over the region of the heart, a rapid pulse, increasing in frequency during exercise, vasomotor instability, and sometimes nervous symptoms with high blood pressure. The sufferer is depressed and irritable. Examination of the heart shows a slight increase in size, and systolic murmurs, irregularly distributed, are heard. Such symptoms are not infrequently observed in civil life among persons who have endured prolonged mental or physical strain with insufficient sleep, and in those recovering from exhausting disease such as grippe or typhoid fever, or during recovery from a severe surgical operation. Sir James Mackenzie, an authority on the heart, believes that the malady is not a true cardiac disease, but that it depends on injury to the central nervous system and in many cases upon bacterial and toxic influences. All observers agree that there is a psychic factor present, and in the treatment a cheerful atmosphere and moderate exercise, alternating with complete rest, are most beneficial. In spite of all treatment, however, recovery is apt to be slow and in the opinion of many of the army physicians, the heart is permanently damaged in a considerable proportion of cases.

**SOLMS-LAUBACH, HERMANN, COUNT.** A German botanist, died at Strassburg in 1916. He was born in 1842, at Laubach, and was educated at the universities of Berlin, Giessen, and Freiburg. He was appointed professor extraordinary at Strassburg in 1872, professor of botany and director of the Botanical Garden at Göttingen in 1879, and to a similar position at Strassburg in 1888. His publications include: "Ueber den Bau und die Entwickelung der Ernährungsorgane parasitischer Phanerogamen," in the *Jahrbücher für wissenschaftliche Botanik* (1867-68); *Corallina* (1881); *Herkunft, Domestikation und Verbreitung des gewöhnlichen Feigenbaums* (1882); *Die Geschlechterdifferenzierung bei den*

*Feigenbäumen* (1885); *Einleitung in die Paläophytologie* (1887); *Die leitenden Gesichtspunkte einer allgemeinen Pflanzengeographie* (1905).

#### SOLOMON ISLANDS PROTECTORATE.

Part of the Solomon Islands, including Bougainville and Buka, are German; the remainder of the group to the southeast of these constitute a British protectorate. Estimated area of the protectorate, 14,800 square miles. Estimated population: natives, about 150,000; whites (1914), 860. The British resident-commissioner has his headquarters at Tulagi.

**SOMALI COAST.** See FRENCH SOMALI COAST.

**SOMALILAND, ITALIAN.** See ITALIAN SOMALILAND.

**SOMALILAND PROTECTORATE.** A British protectorate on the Gulf of Aden. Area, about 68,000 square miles; population (1911), 302,859, largely nomad Mohammedan tribes. Berbera, Bulhar, and Zeila are the chief ports.

**SOMME, BATTLE OF THE.** See MILITARY PROGRESS; WAR OF THE NATIONS.

**SOOYSMITH, CHARLES.** An American civil engineer, died in New York City June 1, 1916. He was born in Buffalo, N. Y., in 1856, graduated from Rensselaer Polytechnic Institute in 1876, and then spent two years studying in Europe at the Polytechnicum, Dresden, and elsewhere. For a short time he was connected with the Santa Fé Railroad, and from 1884 to 1900 he practiced as a civil engineer, being president of SooySmith and Company, contracting engineers. He built railway bridges in Iowa, Nebraska, Maryland, and Kentucky, and served as chief engineer of the Central Bridge over the Harlem River in New York. With his father, William SooySmith (q.v.), he developed the pneumatic caisson method of sinking foundations, applying it in the construction of several high buildings in New York. For the freezing process, as used in subaqueous work, he obtained numerous patents. Mr. SooySmith served as expert in the construction of the New York subways, and shortly before his death was prominently identified with the building of the Belmont-McDonald rapid transit tunnel under the East River.

**SOOYSMITH, WILLIAM.** An American civil engineer, died March 4, 1916, at Medford, Ore. He was born at Tarlton, Ohio, in 1830, took the degrees of A.B. and A.M. at Ohio University, and graduated from the United States Military Academy in 1853. After a year in the army he resigned to take up engineering work. At the opening of the Civil War he was chief engineer in the building of an iron bridge across the Savannah River for the Savannah and Charleston Railroad Company. Before he was retired in 1864, because incapacitated by rheumatism, Mr. SooySmith had risen to the rank of brigadier-general, U. S. A. Subsequently he returned to the practice of his profession in Chicago, and became known for important bridge, lighthouse, and building foundation work. At Glasgow, Mo., he built the first all-steel railway bridge in the world, and he devoted himself to perfecting the pneumatic caisson process for laying bridge foundations, and for excavating tunnels. His work in making possible the erection of high steel buildings in Chicago, by overcoming great foundation difficulties, was especially notable. He undertook to excavate the first Hudson River tunnel, at New York City,

but, without the protection of the tunneling shield, which was invented several years later, an accident occurred, and General SooySmith sold his interest to his son, Charles SooySmith (q.v.), who had collaborated with him in developing the freezing process for subaqueous work.

**SORAUER, PAUL.** A German botanist, died at Berlin, in 1916. He was born at Breslau in 1839, and was educated at the University of Berlin. In 1871 he was appointed director of the experiment station at the Proskau Pomological Institute, and became professor in 1892. Next year he went to Berlin as secretary of the International Phytopathological Commission. He became widely known for his investigations in plant diseases, and founded the *Zeitschrift für Pflanzenkrankheiten* (Stuttgart), besides publishing *Das Handbuch der Pflanzenkrankheiten* (1886; 3rd ed., with Lindau and Reh, 1905-13; Eng. trans., *Manual of Plant Diseases*, 3 vols., 1915 et seq.); *Die Obstbaumkrankheiten* (1879); *Die Schäden der einheimischen Kulturpflanzen durch Schmarotzer, etc.* (1888); *Populäre Pflanzenphysiologie* (1891; Eng. trans., *Popular Treatise on the Physiology of Plants*, (1895); *Pflanzenschutz* (with Frank, 1896; 5th ed., with Röhrig, 1910).

**SOUTH, UNIVERSITY OF THE.** A Protestant Episcopal institution for the education of men at Sewanee, Tenn. It was founded in 1857. In the fall of 1916 there were 118 in the university and 138 in the preparatory school, the Sewanee Military Academy. The faculty of the university numbered 26 and of the military academy 8. The productive funds of the institution amounted to \$395,650 and the total income from all sources to \$119,915. In June the library contained 36,721 volumes. President, Rt. Rev. Albion Williamson Knight.

**SOUTH AFRICA, UNION OF.** A British colony, consisting of four provinces, forming a legislative union under a governor-general. Pretoria (29,618 inhabitants) is the capital, and Cape Town (29,863) the seat of the legislature.

**AREA AND POPULATION.** The total area is 473,100 square miles and the population in 1911 was 5,973,394. A table giving the details will be found in the 1915 YEAR BOOK. Total number of natives, 4,019,006; other colored, 678,146. European birth and death rates: Cape Province, 30,711 and 10,834 per 1000 (colored, 33,000 and 21,349); Transvaal, 36.78 and 11.92; Orange Free State, 29 and 8. Cape Town, the seat of the Union parliament, had, with suburbs, 161,759 inhabitants in 1911 (of whom 85,442 white); Johannesburg, 237,104 (119,953); Pretoria, 57,674 (35,942); Durban, 89,998 (34,880); Port Elizabeth, 37,063 (20,007); Kimberley and Beaconfield, 44,433 (17,507); Germiston, 54,325 (15,579); East London, 24,606 (14,899); Pietermaritzburg, 30,555 (14,737); Bloemfontein, 26,925 (14,720); Krugersdorp, 55,144 (13,132); Boksburg, 43,628 (11,529); Benoni, 32,560 (8639).

**MINING.** The extensive mineral deposits constitute the chief source of the country's wealth. In the output of gold and diamonds the Union leads the world. Other important products are coal, copper, tin, asbestos, graphite, magnesite, zinc, lime, salt, etc. Exports of tin and copper ores, 1914, were valued at £311,391 and £692,355 respectively. Value of other base min-

erals produced in 1914, £639,288. Value of total mineral output in 1914, £45,366,224.

**Gold.** In December, 1914, there were employed in the gold mines 21,975 white and 178,367 colored laborers. The total output for 1911 was £35,049,041 (world's output for the year, £97,250,000), of which the Transvaal furnished £35,041,485 (8,249,461 fine ounces). The Witwatersrand mines contributed £33,599,689 to the Transvaal output. The value of the Transvaal output for 1912 was £38,757,560.

The table below shows the output by provinces in 1913 and 1914:

	Fine ozs.		Pounds Sterling	
	1913	1914	1913	1914
Trans. . . .	8,798,886	8,894,822	87,872,949	85,656,814
Natal . . . .	347	1,706	1,478	7,249
Cape . . . .	30	40	131	167
Union . . . .	8,798,718	8,896,068	87,874,558	85,664,230

**Diamonds.** In December, 1914, 2066 whites were employed in the diamond mines and 4114 colored, besides several thousand individual diggers.

The table below shows the output by provinces in 1913 and 1914:

	Carats		Pounds Sterling	
	1913	1914	1913	1914
Trans. . . .	2,156,897	1,142,688	2,726,663	1,162,031
Cape . . . .	2,461,898	1,350,536	6,995,488	8,544,072
O. F. S. . . .	554,757	807,798	1,667,706	781,091
Union . . . .	5,168,547	2,801,017	11,389,807	5,487,194

**Coal.** White and colored labor employed in coal mines, 1229 and 23,898 respectively.

The table below shows the output by provinces in 1913 and 1914:

	Tons *		Pounds Sterling	
	1913	1914	1913	1914
Trans. . . .	5,225,036	5,157,268	1,142,598	1,150,746
Natal . . . .	2,898,726	2,567,817	891,699	885,919
O. F. S. . . .	609,978	53,621	167,409	31,167
Cape . . . .	67,481	699,217	88,752	191,064
Union . . . .	8,801,216	8,477,923	2,240,458	2,258,896

\* Tons of 2000 pounds.

**FORESTS.** The total area reserved for forest purposes in the Union of South Africa is approximately 914,598 morgen (1,930,818 acres). The timbered area is approximately 400,000 acres, of which some 63,498 acres consist of artificial forests termed plantations. The attention of the government has been given to the economical and systematic working of the crown forests. The Union is divided into seven conservancies, each controlled by a conservator of forests, stationed at Cape Town, King William's Town, Knysna, Umtata, Pretoria, Maritzburg, and Bloemfontein respectively, who is directly responsible to the chief conservator of forests for the Union at Pretoria. The present annual importation of timber into the Union is about 14,000,000 cubic feet, mostly pine, derived from Europe and America, the balance being hard wood from Australia. There is at present a large importation of hard wood sleepers. Expenditure on forests for financial year 1913-14, £120,827, cash revenue £52,796; value of gratis issues from forest estate, £26,371; total revenue, £79,167. Timber removals from



forest estate during 1913-14 aggregated 1,295,406 cubic feet.

**OTHER INDUSTRIES.** Agriculture, stock raising, and dairying are practiced. Ostrich feathers and wool are important products for export.

**COMMERCE.** By proclamation dated Aug. 5, 1914, the export of foodstuffs, except by special permit, has been prohibited. In a communication of Aug. 14, 1914, it is specified that: (1) the export of cereal foodstuffs to over-sea countries (except to ports in Great Britain) is absolutely prohibited; (2) the export of cereals for Great Britain is authorized by special permission; (3) the export of all kinds of foodstuffs for consumption in Basutoland, Swaziland, Bechuanaland Protectorate, Rhodesia, Mozambique Province, and the Congo is permitted.

By orders dated Oct. 15 and Dec. 29, 1915, Feb. 1, March 8, and April 5, 1916, the export of foodstuffs, fodder, and all oleaginous seeds is prohibited except with the permission of the minister of railways and harbors. The export of raw cotton is also prohibited except with the permission of the commissioner of customs and excise. The restrictions apply to all destinations.

The total value of the imports and exports in the trade of the Union, exclusive of specie, is shown in the table below, for three comparative years:

	1913	1913	1914
Imports .....	238,838,960	241,828,841	235,354,971
Exports .....	62,974,210	66,569,364	39,933,612

A table of the principal imports for home consumption, and exports of domestic produce, in the 1914 trade, follows, values in thousands of pounds sterling:

Imports	£1000	Exports	£1000
Foodstuffs .....	5,976	Gold .....	20,544
Cotton mfrs. ....	2,861	Diamonds .....	5,813
Apparel .....	2,286	Wool .....	4,288
Hardware .....	1,382	Feathers .....	1,343
Leather mfrs. ....	1,406	Coal .....	1,248
Machinery .....	2,511	Hides and skins ..	1,572
Haberdashery .....	1,078	Mohair .....	834
Iron and steel .....	1,047	Copper .....	700
Wood, etc. ....	893	Bark .....	286
Drugs, etc. ....	886	Tin ore .....	458
Oils .....	805	Whale oil .....	104
Furniture .....	458	Fish .....	112
Glycerine .....	432	Fruit .....	97
Woolen mfrs. ....	689	Fodder .....	48

The United Kingdom contributed 56.88 per cent of the imports.

During 1914, 4008 vessels of 11,624,577 tons net entered, and 4009 vessels of 11,610,642 tons net cleared.

**COMMUNICATIONS.** Prior to union, which took effect in May, 1910, the state railways of the several colonies now composing the Union were operated by the separate governments. In May, 1910, the government lines were merged into one system, the South African Railways, under the control of the Union government. The total open mileage of this system at the end of 1914 was 8486 miles (Cape 3705, Orange Free State 1180, Transvaal 2436, and Natal 1164), of which 7978 miles are 3 ft. 6 in. gauge, and 508 miles 2 ft. gauge.

The capital expenditure on government railways up to Dec. 31, 1914, amounted to £69,804,581 plus £14,973,184 in respect of rolling stock,

or a total of £84,777,765. (This does not include £1,420,585 spent during the year on the construction of new lines.) The gross earnings for 1914 were £11,573,204 and the net loss after payment of interest £191,024. Working expenditure (including renewals) amounted to £8,840,208 or 76.4 per cent of the gross revenue, as compared with £8,964,690 or 72.4 per cent of the gross revenue in the preceding year.

**FINANCE AND GOVERNMENT.** In the table below are shown revenue and expenditure for three comparative years (1914-15 estimate):

	1911-12	1913-14	1914-15
Revenue .....	217,869,080	217,268,178	217,968,250
Expenditure ..	16,547,380	17,662,014	18,312,194

The total public debt stood, March 31, 1914, at £126,296,250.

The act constituting the Union provides for the appointment by the sovereign of a governor-general, who with the executive council (of which the members are chosen and summoned by him), administers the executive government of the Union as the governor-general in council. Departments of state are established by the governor-general in council, the governor-general appointing not more than 10 officers to administer them. Such officers are king's ministers of state for the Union and members of the executive council.

The senate consists of forty members. For 10 years after the establishment of the Union eight members are nominated by the governor-general in council and 32 are elected, eight for each province. The first election was made prior to the establishment of the Union by the two houses of each of the colonial legislatures sitting as one body, and a vacancy will be filled by the choice of the provincial council in respect of whose province a vacancy occurs.

The house of assembly consists of 130 elected members, 51 of whom represent the Cape of Good Hope, 17 Natal, 45 Transvaal, and 17 the Orange Free State. Members of both houses must be British subjects of European descent.

## HISTORY

**PARLIAMENTARY SESSION.** The strength of parties after the general election for the second Union Parliament was as follows: South African party, 54; Unionist, 40; Nationalist, 27; Independent, 6; Labor, 3. The government depended on the support of the Unionists who had pledged themselves to sustain General Botha till the end of the war. During the first session of Parliament (December, 1915-June, 1916) 48 bills were passed of which 20 were financial. Among the others may be mentioned several important consolidating measures designed to unify the laws of the separate provinces, on the subjects of insolvency, patents, trademarks, railway regulation and management, and mental disorders; three measures which aimed to settle the university question; and finally a trading with the enemy act framed on the same lines as that of the mother country (see GREAT BRITAIN, *History*), which was not carried till near the end of the session and only after sharp controversy. The South African party continued loyal to the Botha government, though there were signs of some wavering among a few of its members. The Nationalists con-

tinued their vigorous opposition, and were reinforced on the war issue by the small Labor vote. Nationalists attacked especially the Trading with the Enemy bill, arguing that it went too far, that it would ruin many worthy German settlers, cause hardship and race hatred, and unduly subordinated South African to Imperial interests. The Nationalists also continued steadily to oppose every project for aiding the Empire either with men or money for the prosecution of the war, which, they argued, did not concern South Africa.

**WAR CONTRIBUTIONS.** War expenditure since the beginning of the war has been defrayed by loan. Estimates of war expenditures from August, 1914, to March, 1917, were £26,693,000, including cost of suppressing the rebellion, of the German Southwest African expedition, of the equipment of the German East African contingent, of internment camps, and of garrisoning the conquered territory. As regards men, it was estimated toward the close of 1916 that South Africa had placed in the field about 60,000 men. The natives had been largely employed on work connected with the war. In the German West African campaign 40,000 were engaged in building military railways and other operations, and toward the close of the year a contingent of 10,000 Kaffirs was being organized for work on the harbors of France, whither a body of 1000 had already been dispatched. Among the whites there were signs at the close of the year that voluntary recruiting had reached its limit.

**PARTY ISSUES.** Two important party congresses held after the parliamentary session brought out sharply the conflicting views. General Botha at a congress of his supporters at Bloemfontein on August 23rd renewed his expressions of confidence in ultimate victory and pointed to the satisfactory progress in German East Africa, but referred to a new movement to stir up a rebellion. Its ringleaders had made overtures to General de Wet, who promptly reported the movement to the government. General Hertzog and his followers met at Pretoria on the same date. The former renewed his attack on imperialism, declaring that the position of Generals Botha and Smuts that England's wars were necessarily the wars of all portions of the Empire was the gravest of errors.

**SOUTH AMERICA.** See various South American countries; also **EXPLORATION, South America.**

**SOUTH AUSTRALIA.** A state of the Commonwealth of Australia, occupying the central and southern part of the continent between Western Australia on the west and Queensland, New South Wales, and Victoria on the east. The estimated area is 380,070 square miles, which is about 12.8 per cent of the area of the Commonwealth. The population according to the census of 1911 was 408,558 (207,358 males, 201,200 females), exclusive of full-blooded aboriginals. The increase per cent in the decade 1901-11 was 14.01, in 1891-1901 13.57, in 1881-91 14.15. Estimated population June 30, 1915, 438,195. The capital is Adelaide; its population at the 1911 census was 32,981; including suburbs, 189,646; estimate in 1914, 205,443.

The executive authority rests with a governor, who is appointed by the crown and is assisted by a responsible ministry. The Parliament consists of two chambers, the Legislative

Council and the House of Assembly, both elective; the former consists of 20 members, the latter of 46 members chosen for three years. South Australia was the first of the states to grant woman suffrage, the franchise being exercised for the first time at the House of Assembly election on April 25, 1896. The Governor in 1916 (from March, 1914) was Lieut.-Col. Sir Henry Lionel Galway, K.C.M.G., D.S.O.; premier, treasurer, and minister of education, Crawford Vaughan. See **AUSTRALIA**; also **AGRICULTURE.**

**SOUTH CAROLINA. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 1,634,340. The population in 1910 was 1,515,400.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

		<i>Acreage</i>	<i>Prod. Bu.</i>	<i>Value</i>
Corn	1916	2,065,000	32,008,000	\$86,189,000
	1915	2,180,000	35,145,000	80,576,000
Wheat	1916	210,000	2,226,000	4,207,000
	1915	225,000	2,430,000	3,353,000
Oats	1916	500,000	9,000,000	7,200,000
	1915	525,000	9,975,000	6,683,000
Rice	1916	3,500	49,000	44,000
	1915	3,700	90,000	81,000
Potatoes	1916	10,000	750,000	1,312,000
	1915	11,000	880,000	1,012,000
Hay	1916	250,000	a 325,000	5,428,000
	1915	220,000	286,000	4,462,000
Tobacco	1916	89,000	b 28,280,000	2,839,000
	1915	65,000	37,700,000	2,639,000
Cotton	1916	2,834,000	c 920,000	86,085,000
	1915	2,516,000	1,134,000	61,156,000
Rye	1916	5,000	49,000	91,000
	1915	3,000	30,000	45,000

a Tons. b Pounds. c Bales of 500 pounds gross weight.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments	1,854	1,885
Average number of wage earners	73,046	71,914
Capital invested	\$173,221,000	\$203,211,000
Wages	20,361,000	24,173,000
The value of materials used	66,851,000	91,009,000
The value of products	113,236,000	138,891,000

**TRANSPORTATION.** The total railway mileage of the State in 1915, the latest date for which statistics are available, was 4466. The railways having the longest mileage were the Southern, 1122; Atlantic Coast Line, 886; Sea Board Air Line, 362.

**EDUCATION.** The total enrollment in the public schools of the State in 1915 was as follows: White 180,316, negro 192,525, or a total of 372,841. The average daily attendance in schools for white children was 123,118, for the negro children 127,567, or a total of 250,685. The total number of white teachers was 5072, and of negro teachers 2998, or a total of 8070. The total school revenue for the year was \$4,039,382, and the total expenditure \$3,295,506. The average yearly salary paid to male teachers was \$594.72, to women teachers \$340.54; to negro male teachers \$127.77, and to women \$106.83.

**FINANCE.** The total receipts for the fiscal

year 1915, the latest for which figures are available, were \$3,645,363. On Dec. 31, 1914, there was a balance of \$352,718. The total expenditures for the year amounted to \$3,447,423, leaving a balance on Dec. 31, 1915, of \$550,658.

**CHARITIES AND CORRECTIONS.** The State charitable and correctional institutions include the State Hospital for the Insane, Confederate Infirmary of South Carolina, South Carolina School for the Deaf and Dumb, State Penitentiary at Columbia, State Reformatory for Negro Boys at Columbia, and State Farm at Boykin. There is also an industrial school in Florence and a State tuberculosis hospital, but the latter is not a charitable institution. A State Board of Charities and Corrections was created in 1915 and its first report was issued in 1916. It has general charge over the institutions noted above, as well as care of poor and dependent children in the various counties.

**POLITICS AND GOVERNMENT.** The renomination and reelection of Gov. Richard I. Manning were the outstanding events of the year in South Carolina politics. The primary nomination, of course, was of chief interest, as the candidate of the Democratic party in recent years has had almost no opposition at the general election. This year the situation was somewhat complicated by talk of a bolt, which, however, amounted to little when the ballots were counted. From the beginning the Democratic campaign promised to assume its usual violence, and the promise was well fulfilled before the primary nominees were declared. In the race for Governor were Richard I. Manning, the incumbent; Robert A. Cooper, who had been a candidate two years before and had been kept out of the second race by a few hundred votes; and Cole L. Blease, for two terms Governor and in 1914 an unsuccessful primary candidate against United States Senator E. D. Smith. Besides there were two nominal entrants—John T. Duncan and John M. DesChamps. The vote of the two last named was negligible. The race narrowed down to three men—Governor Manning and Messrs. Cooper and Blease. Mr. Blease, as in previous campaigns, violently attacked his opponents and the newspapers which opposed him. Governor Manning ran on his record as a law-enforcing Governor and business executive, and Mr. Cooper on a similar platform of law enforcement and economy. Under the South Carolina primary system, the nominee must receive a majority of all the votes cast. If no candidate receives a majority, the two highest in the first primary enter a second primary two weeks after the first, the high man in the run-off primary being given the nomination. In the first primary—held August 29th—Blease ran more than 20,000 votes ahead of Governor Manning, the second man, and lacked but 5000 of having a majority. Between the first and second primaries, however, the Manning forces, with the indorsement of Mr. Cooper, did an amazing amount of personal work, and the second primary saw the Governor nominated for a second term by a majority of about 4700 votes, the count standing: Manning, 71,459; Blease, 66,791. The Blease forces made many charges of fraud, intimidation, and the use of "whiskey and money," but entered no contest. After Governor Manning had been declared the nominee certain friends of Mr. Blease advised a bolt in the general election,

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claiming they had been defrauded, but the movement failed, Blease receiving only 1089 votes to 60,405 for Governor Manning. J. C. Gibbs, Socialist candidate, received 162, and John M. Cantey, Progressive, 35. With Governor Manning was elected the entire Democratic State ticket, it having no opposition. All members of both branches of the general assembly are Democrats, as is the entire membership of the bench, both Supreme Court and Circuit Court. The judges are chosen by the Legislature.

In the national campaign South Carolina was interested solely in the vote in other States, the result in this State being a foregone conclusion. However, the State cast an unusually heavy vote, giving Wilson a majority of about 60,000. The vote for presidential electors was: Democratic, 61,846; Republican, 1550; Progressive Republican (a wing of the Republican party), 258; Progressive, 162; Socialist, 135.

**LEGISLATION.** The Legislature met in 1916, and enacted many important measures. A record of some of these is given below:

A measure was passed requiring the State Charities Board to investigate the financial condition of persons holding scholarships in the State higher educational institutions. A commission was created to report on a State system of rural credits. Provision was made for the government of the militia to conform to the United States requirements. It was made a misdemeanor to sell any formula or distilling apparatus for making intoxicating beverages, except those containing less than 2 per cent alcohol, or preparations for medicinal purposes. Certain corporations are required to pay wages weekly. The hours of employees on interurban railways are limited to 10 daily. The age at which children may work in factories, etc., was raised from 12 to 14 years. The laws relating to insurance were amended, as were also the measures relating to public utilities.

**STATE OFFICERS.** Governor, Richard I. Manning; Lieutenant-Governor, Andrew J. Bethea; Secretary of State, W. Banks Dove; Attorney-General, Thomas H. Peoples; Treasurer, S. T. Carter; Comptroller, C. W. Sawyer; Superintendent of Education, John E. Swearingin; Adjutant-General, W. W. Moore; Commissioner of Agriculture, E. J. Watson; Commissioner of Insurance, F. H. McMaster—all Democrats.

**JUDICIARY.** Supreme Court: Chief Justice, Eugene B. Gary; Justices, D. E. Hydrick, R. C. Watts, Thomas B. Fraser, and George W. Gage; Clerk, U. R. Brooks.

**STATE LEGISLATURE.** Wholly Democratic.

**SOUTH CAROLINA, UNIVERSITY OF.** A non-sectarian co-educational institution. It was opened in 1805. Since 1878 it has been divided into two branches, the South Carolina College at Columbia, S. C., and the Clafin College for Negroes at Orangeburg. There were 475 students enrolled in the fall of 1916 and the faculty numbered 42. Dr. A. N. Lucian was appointed associate professor of physics and H. E. Dennison adjunct professor of history. The university is dependent on annual legislative appropriations. The library contains 50,000 volumes. President, William Spenser Currell.

**SOUTH DAKOTA. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 707,740. The population in 1910 was 583,888.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16, were as follows:

	Acreage	Prod. Bu.	Value
Corn . . . . . 1916	2,950,000	84,075,000	\$64,738,000
1915	3,250,000	94,250,000	46,182,000
Wheat . . . 1916	3,650,000	24,825,000	87,237,000
1915	3,725,000	63,762,000	54,835,000
Oats . . . . . 1916	1,850,000	56,425,000	25,956,000
1915	1,725,000	72,450,000	20,286,000
Potatoes . . 1916	65,000	4,290,000	5,877,000
1915	68,000	7,820,000	2,737,000
Hay . . . . . 1916	730,000	1,387,000	7,490,000
1915	610,000	1,220,000	6,466,000
Rye . . . . . 1916	250,000	4,500,000	5,810,000
1915	200,000	3,900,000	2,964,000
Barley . . . 1916	825,000	18,728,000	15,544,000
1915	750,000	24,000,000	11,040,000

<sup>a</sup> Tons.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments . . .	1,020	898
Average number of wage earners . . . . .	3,602	3,788
Capital invested . . . . .	\$13,018,000	\$15,060,000
Wages . . . . .	2,297,000	2,628,000
The value of materials used . .	11,476,000	17,080,000
The value of products . . . . .	17,870,000	24,139,000

**MINERAL PRODUCTION.** The total value of the production of gold, silver, copper, and lead in 1915 was \$7,507,782, an increase of \$76,493 over the yield of 1914. The total output of gold was 358,280 fine ounces, valued at \$7,406,305.

The gold production of the State in 1916 was \$7,463,000, compared with \$7,406,305 in 1915. The silver produced was 209,000 ounces, compared with 199,864 ounces in 1915. There was a small quantity of lead produced.

**TRANSPORTATION.** The total railway mileage of the State in 1916 was 4145. The lines having the longest mileage are the Chicago, Milwaukee, and St. Paul, 1794, the Chicago and Northwestern, 1000. No new lines were constructed during the year.

**EDUCATION.** The total number of persons of school age on May 1, 1916, was 177,067. The total enrollment in the public schools was 134,136. The average daily attendance was 87,020. There were employed 6025 female and 1032 male teachers. The average monthly salary of male teachers was \$86.15, and of females \$60.01. During the year special efforts were made to push the organization of consolidated schools, thus bringing to the children of country districts the advantages of graded schools. The vocational aspect of school work was especially stressed.

**FINANCE.** The latest statistics for the State finances are for June 30, 1914. At the beginning of that fiscal year there was in the treasury a balance of \$925,135. The receipts for the year amounted to \$4,337,928, and the disbursements to \$4,444,939, leaving a balance on June 30, 1914, of \$818,123.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include the School for the Deaf and Dumb, School for the Blind,

Northern Hospital for the Insane, the Custer Sanatorium, and the State School for Deaf Mutes, at Sioux Falls.

**POLITICS AND GOVERNMENT.** The campaign of 1916 was the quietest of any political campaign in the history of the State. At the primary election in May, which was provided for by a special session of the Legislature held in February, delegates were selected by the Democrats instructed for Wilson, and by the Republicans a delegation headed by Governor Byrnes instructed for Senator Cummins. The most interest hinged on the Republican nomination for Governor. Peter Norbeck, Lieutenant-Governor, was nominated over George W. Egan and R. O. Richards. The Presidential and State campaigns during the summer and fall were so quiet that many believed a small vote would be cast in November, but the general election brought forth more votes than any prior State election. Mr. Norbeck was elected Governor over his Democratic opponent by 22,244 votes. Five referred laws and initiative laws submitted to the voters were all defeated, although the Richards primary lost by only 323 votes out of a total of more than 105,000 cast. Nine constitutional amendments were submitted. The most important was the adoption of constitutional prohibition of the liquor traffic, which was adopted by a vote of 65,334 to 53,038. An amendment authorizing the State to spend money in development of good roads and coal mines was adopted, likewise an amendment allowing municipalities to aid in irrigation. A State and county rural credit amendment was also adopted. All others, including equal suffrage, were defeated. The vote on woman suffrage was 53,432 yes, 58,350 no.

**OTHER EVENTS.** Good crops and high prices made much prosperity among the farmers and stock men. Dairy interests have grown amazingly in the territory west of the Missouri River. In this same section much interest was manifested in the indications and prospects for successful oil wells. Many natural gas wells, the supply coming with artesian water, have been developed. The mining industry has developed greatly and tungsten has been produced in large quantities in the Black Hills section. The Supreme Court, in an important decision, declared that laws passed by the Legislature with an emergency clause attached, could nevertheless be sent to the referendum. This will result in fewer emergency laws in the future. A State bank guaranty law had its first trial in case of the failure of a bank at Owatoma, resulting in all depositors being paid in full in less than 30 days from the time the bank closed its doors.

As a result of elections held on April 18th 14 cities and towns in the State voted against saloons. These included Pierre, the capital, and Hot Springs. Aberdeen, the second largest city in the State, again voted against saloons, while Sioux Falls voted for a reconsideration by a majority of 380.

In January the United States Supreme Court decided against the State in the long contested express tax cases. In 1909 the State assessed the Wells Fargo and the American Express companies on their gross earnings, instead of on their property within the State. Judge Williard, of the United States District Court, decided against the State. The State did not take

an appeal, but in the next year assessed the companies in the same way, and this action was sustained by Judge Elliott of the United States Supreme Court. The companies appealed from the decision, and the United States Supreme Court reversed Judge Elliott.

The Attorney-General of the State in February decided to appeal from the decision of Judge Elliott, of the United States District Court, by declaring the Blue Sky Law of the State unconstitutional. Similar laws in other States had been declared unconstitutional, but this was the first to be appealed to the United States Supreme Court.

The State celebrated the anniversary of its settlement in July. In Yankton a pageant was given which is described as the largest and most significant dramatic entertainment ever given in the State. It dealt with certain important episodes in the history of the State.

**STATE OFFICERS.** Governor, Peter Norbeck; Lieutenant-Governor, W. H. McMaster; Secretary of State, Frank M. Rood; Treasurer, G. H. Helgerson; Superintendent of Education, Charles H. Lugg; Attorney-General, C. C. Caldwell; Adjutant-General, W. A. Morris; Auditor, J. E. Handlin; Commissioner of Agriculture, N. E. Knight; Commissioner of Insurance, M. H. O'Brien—all Republicans.

**JUDICIARY.** Supreme Court: Presiding Judge, John Howard Gates; Justices, Charles S. Whiting, E. G. Smith, James H. McCoy, Samuel C. Polley; Clerk, E. F. Swartz.

**STATE LEGISLATURE:**

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Republicans .....	36	90	126
Democrats .....	10	18	28
Republican majority..	26	77	103

**SOUTH DAKOTA, UNIVERSITY OF.** A co-educational State institution at Vermillion, S. Dak., founded in 1883. There were 605 students registered in the autumn of 1916 and the faculty numbered 60. The university had a total income for 1915-16 of \$195,733. There are 35,000 volumes in the library. President, Robert Lincoln Slagle.

**SOUTH DAKOTA STATE COLLEGE OF AGRICULTURAL AND MECHANIC ARTS.** A co-educational State institution at Brookings, S. Dak., founded in 1881. The total enrollment in all departments in the fall of 1916 was 689 and there were 72 faculty members. During the year Miss Mabel Ward was elected professor of home economics to succeed Nola K. Fromme, resigned. The income in 1916 was about \$30,000. The library contained 26,000 volumes. President, Ellwood Chappell Perisho.

**SOUTHERN FLOODS.** See FLOODS AND FLOOD PREVENTION.

**SOUTHERN NIGERIA.** See NIGERIA.

**SOUTHERN RHODESIA.** See RHODESIA.

**SOUTHERN SOCIOLOGICAL CONGRESS.**

See SOCIOLOGY.

**SOUTH GEORGIA.** An island dependency of the Falkland Islands (q.v.).

**SOUTH ORKNEY ISLANDS.** A dependency of the Falkland Islands (q.v.).

**SOUTH POLE.** See POLAR RESEARCH, *Antarctic*.

**SOUTH SHETLAND ISLANDS.** See FALKLAND ISLANDS.

**SOY BEAN FLOUR.** See FOOD AND NUTRITION.

**SPAIN.** A constitutional monarchy of southwestern Europe, hereditary in the male and female lines of the house of Bourbon-Anjou. It occupies the eastern part of the Iberian Peninsula and is separated from France by the Pyrenees. Madrid is the capital.

**AREA AND POPULATION.** The total area is 504,547 square kilometers, or 194,794 square miles. The population, according to the census of Dec. 31, 1910, was 19,943,817, an average density for the kingdom of 40 to the square kilometer. The number of marriages in 1914 was 132,451; births, 609,188; deaths, 451,098, emigrants, 66,596 (50,359 in 1915). The communal population (1910) of Madrid was 599,887, Barcelona 587,411, Valencia, 233,348, Seville 158,287, Málaga 136,365, Murcia 125,057, Saragossa 111,704, Carthagena 102,519, Bilbao, 93,536, Granada, 80,511, Lorca 72,795, Valladolid 71,066, Palma (Balears) 67,544, Cádiz 67,174, Córdoba, 66,831, Santander, 65,046, Santa Cruz de Tenerife 63,004, Jerez de la Frontera 61,250, Las Palmas 60,338, Alicante 55,300, Gijón 55,086, Oviedo 53,269, Badajoz 35,039.

**EDUCATION AND RELIGION.** The municipalities bear the main cost of education, which is free but totally inadequate. The clergy still control many schools, though recent legislation provides for inspection and direction of staff and curricula. Illiteracy is widespread. Each province maintains a high school, but the curricula are defective. Special schools are few and ill attended. There are universities in 10 cities. The Roman Catholic is the state religion and until 1910 public exercise of all other creeds was prohibited. In that year limited privileges were tendered to Protestant worship.

**PRODUCTION.** The interior is an elevated tableland, surrounded by mountain ranges. The soil is fertile, but 60 per cent of the area is uncultivated. All sub-tropical fruits thrive. Grains are easily grown and the vine flourishes in every province of the kingdom. Sherry, tent wines, malaga, and alicante are Spanish wines in demand for export, and large quantities of ordinary wines are produced for home consumption.

The area in acres under the principal crops and the yield (for three years) in hundred-weights were as follows:

	1913	1914	1915
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Wheat .....	9,640,224	9,676,879	9,222,560
Barley .....	3,867,871	3,402,558	3,784,813
Oats .....	1,350,804	1,808,214	1,402,800
Rye .....	1,917,144	1,886,206	1,817,955
Corn .....	1,104,418	1,136,736	1,139,914
Millet .....	4,873	5,720	5,705
Meslin .....	90,995	108,018	100,284
Rice .....	95,885	96,824	97,772
Beans .....	464,041	453,823	476,655
Kidney beans .....	674,653	694,890	716,695
Peas .....	85,513	91,497	92,143
Chick peas .....	453,284	463,572	463,777
Lentils .....	42,338	40,814	46,774
Tare .....	457,298	459,232	475,759
Vetches .....	107,558	113,985	122,317

	1913	1914	1915
	<i>Owts.</i>	<i>Owts.</i>	<i>Owts.</i>
Wheat .....	61,181,588	68,188,978	75,822,056
Barley .....	29,946,938	31,470,896	36,089,364
Oats .....	7,354,290	9,065,240	10,726,332
Rye .....	14,182,228	12,167,140	13,260,606
Corn .....	12,771,612	15,405,858	12,866,944

	1913 Owts.	1914 Owts.	1915 Owts.
Millet .....	35,746	70,952	11,240
Meal .....	474,476	513,136	532,200
Rice .....	4,457,606	4,591,640	4,708,612
Beans .....	3,348,294	2,939,512	3,256,660
Kidney beans .....	3,040,184	3,879,126	3,987,832
Peas .....	807,228	508,796	456,898
Chick peas .....	1,577,472	1,904,440	2,097,626
Lentils .....	186,018	191,414	221,974
Tare .....	2,006,436	2,178,356	1,966,724
Vetches .....	538,120	708,438	680,470

Olives, citrous fruits, almonds, pomegranates, dates, etc., are exported. There were in 1911 (December 31st) 546,035 horses, 904,725 mules and hinnies, 836,741 donkeys, 2,541,112 cattle, 15,725,882 sheep, 3,369,624 goats, 2,472,416 swine, and 3398 camels.

Iron, copper, and lead deposits exist in profitable quantities; the mines in operation, however, are run with foreign capital under foreign management. The total output for 1913 was valued at 269,744,912 pesetas.

The value of the fisheries products was estimated at about 71,995,715 pesetas in 1914. There are cotton, woolen, paper, cigarette, glass, and cork factories.

COMMERCE AND COMMUNICATIONS. The value of imports for home consumption and exports of domestic produce are shown in the table below in thousands of pesetas:

	1908	1911	1913	1914
Imports .....	981,625	993,832	1,140,651	1,110,866
Exports .....	896,342	961,969	1,145,992	948,091

The principal countries of origin and destination in the 1912 trade (with values in thousands of pesetas) were Great Britain, France, United States, Germany, Argentina, Portugal, British India, Russia, etc.

Principal articles of import and export are shown below, values in thousands of pesetas, for 1914:

	Imp.	Exp.
Stone, minerals, etc. ....	114,546	114,056
Metals and mfrs. ....	54,954	120,841
Drugs and chem. prods. ....	118,339	84,820
Cotton mfrs. ....	188,203	47,241
Other veg. fibres, etc. ....	19,841	4,226
Wool and hair, etc. ....	12,692	59,789
Silk and mfrs. ....	21,590	4,938
Paper, etc. ....	12,300	11,922
Timber and mfrs. ....	56,220	62,796
Animals, etc. ....	47,647	37,311
Machinery .....	128,276	4,073
Alimentary substances .....	251,519	355,822
Various .....	23,413	10,039
Precious metals .....	28,417	13,177
Other .....	.....	.....
Total .....	1,110,866	948,091

Vessels entered in the 1914 trade, 18,519 of 22,229,159 tons; cleared, 16,482 of 19,265,265.

Railways in operation Jan. 1, 1912, 14,805 kilometers. The total length of the railways in Spain was 9377 miles, of which more than three-quarters was of standard gauge. The receipts of the railways decreased \$3,000,000 in 1914, from receipts of 1913. Since the outbreak of the war there was a tendency to put the Spanish railways under French control and when the president of the Southern Railways of Spain died in 1915 his interest in the railways was purchased by the British government in order to keep the line, which serves important British mining interests, from falling into German

hands. The shares so purchased were transferred to the Andalusian Railway Company, a French concern, which had long wanted to get control of the Southern Railway, in order to secure a monopoly of the southwestern corner of Spain. Telegraph lines, 42,935 kilometers; wires, 93,495 kilometers; stations, 1956 (state, 1118); wireless stations, 22 and 66 on board vessels. Post offices, 6041.

FINANCE. The peseta (par value 19.295 cents) is the unit of value. Spain has still a paper currency. Gold is quoted at about 7 to 9 per cent premium. Revenue and expenditure in pesetas are given below for three years:

	1910	1914	1915
Revenue ..	1,071,240,342	1,848,731,639	1,916,528,000
Expenditure	1,028,214,361	1,437,350,660	1,948,958,000

The budget for 1916 follows; it will be seen that it is identical with the 1915 budget, owing to the fact that the new government which came in in December, 1915, adopted the 1915 budget for the ensuing year:

Revenue	1000 Ps.	Expenditure	1000 Ps.
Direct taxes on land, trade, government salaries, registration, etc. . . . .	490,108	Public debt .....	422,520
Indirect taxes, customs, excise, etc. . . . .	431,800	Pensions .....	47,585
Tobacco monopoly, lottery, mint, and minor sundries ..	313,370	State .....	928
Revenue from lands .....	81,771	Worship .....	41,689
Public treasury ..	81,771	Justice .....	19,864
		War .....	164,641
		Marine .....	68,784
		Interior .....	94,152
		Instruction .....	74,356
		Public works ..	184,321
		Finance .....	18,584
		Collecting .....	150,991
		Colonies .....	1,800
		Morocco * .....	124,802
		Other .....	.....
Total .....	1,280,536	Total .....	1,465,044

\* Campaign.

The public debt stood, Jan. 1, 1916, at 9,404,043,346 pesetas.

GOVERNMENT. The constitution of June 30, 1876, vests the executive power in a sovereign, acting through a responsible council of ministers. The legislative authority rests conjointly with the king, in the Cortes, composed of a senate (180 life members—princes of the blood, nobles, magnates, and functionaries—and 180 members indirectly elected for five years) and a chamber of deputies (404 members elected for five years by the electoral colleges).

The reigning king, Alfonso XIII, was born May 17, 1886, after his father's death. Until he was 16 years old (the age at which a Spanish sovereign attains his majority) his mother reigned as queen-regent. He married, May 31, 1906, Princess Victoria Eugenie of Battenberg, and has three sons and two daughters. Heir apparent, Prince Alfonso, born May 10, 1907.

HISTORY

SUMMARY OF EVENTS. The most important feature of the year was Spain's attitude toward the belligerent Powers, discussed in a succeeding paragraph. Other events may be briefly summarized. As reported in the last YEAR BOOK the Cortes was dissolved on December 23rd. During the next three months there was a great deal of economic disturbance. There was a bakers' strike in Madrid caused by the high

price of flour, and followed by the resignation of the mayor. A general strike was proclaimed in Valencia and in many of the industrial centres there was similar trouble. There was dissension in the Liberal ministry regarding the deepening of the harbor of Barcelona, and the Minister of Finance, Urzaiz, resigned, and the Foreign Minister assumed his portfolio, while the Prime Minister took over the portfolio of the Foreign Office. The ministry, however, secured a strong majority in the election of April 9th, having 235 out of a total of 431, the other parties being distributed as follows: Conservatives, 86; Republicans, 19; Maurists, 16; Regionalists, 13; Laciervists, 8; Jaimists, 8; Independents, 10; Catholics, 4; Nationalists, 1; and Integristas, 1. The Liberals had also a considerable majority in the upper chamber of the Cortes. On April 30th there were changes in the cabinet, Villanueva and Salvador retiring, and Jimeno became Foreign Minister, Alba Minister of Finance, Jimenez of the Interior, and Gasset of Public Works. After the death of Señor Barroco, Minister of Justice, October 7th, Señor Alvarado succeeded to the portfolio. The Conservative, Maura, and the Jaimist, Mella, organized a *bloc* of the Right against the government.

A general strike was proclaimed in July as the result of a serious industrial crisis, and the government immediately declared martial law throughout the country, whereupon the strikers agreed to arbitrate their demands and work was resumed. In July a manifesto called an Address by Spanish Catholics to Belgium was issued in which the acts of the Germans in Belgium were condemned and sympathy expressed for Belgium. It demanded reparation for the wrongs done Belgium and expressed the hope that their liberty and welfare would be completely restored. The signatures to the document were 500 in number, the names coming chiefly from the literary, clerical, and university classes.

The King having replied with generosity to a request on the part of a relative for aid in finding a missing soldier, received many similar requests, and finally established a bureau of mercy under his own personal charge for carrying out that work. Early in the year about 200,000 letters had come in from France alone. A numerous staff was employed at the Royal Palace of Madrid. At the close of the year public attention was drawn to Spain's reply to President Wilson's peace note, which was published in Spain before delivery in the United States. It declared Spain's sympathy with the President's purpose but her belief that the time was inopportune and success impossible. It therefore reserved its measures for peace to a future date when conditions should be more favorable. Spain's reply was the first to offer a suggestion of an entente among neutrals. It said: "Meanwhile the Spanish government believes the time has come to declare, as regards an entente among the neutral powers, that it is disposed now, as it was at the beginning of the war, to open negotiations that might bring about an understanding whereby it would be possible to reunite all the belligerent powers." See STRIKES AND LOCKOUTS; WAR OF THE NATIONS, *Discussions of Peace*.

NEUTRALITY. The attitude of the government toward the war continued to be outwardly neu-

tral. As to the feeling in Spain, it was according to all accounts sharply divided. At the court there were partisans of each group of belligerents, and in the country at large the aristocracy and the wealthy classes seemed generally on the side of Germany, while the intellectuals and a large number of the common people were partisans of France. The Carlists and the anti-dynastic parties were pro-German, while the Reform party and the Republicans were for the French. The principles at the basis of the government's policy were that peace was the chief interest of Spain, but that from her geographical position it was above all important that she should be on good terms with England and France. The King at an early stage removed all French anxiety in regard to the Pyrenees and Morocco by the assurance that Spain would take no further action there, and at the same time he assured Great Britain on the score of Portugal, withdrawing some of the garrisons in the valley of the Tagos. Early in April it was announced that the British had acquired a controlling interest in the South of Spain Railway, tapping one of the largest mineral regions in the country. The relations with France and England were, from the first, friendly, and this policy was supported by all parties in Parliament. Outside Parliament, however, it occasioned hostility on the ground that it was unfair to the Central Powers. The Entente Allies derived much advantage from Spain as a source of supply, for while neutrality opened a way to any power that could receive her supplies, England and France were the only ones that could profit from it. Señor Maura revived the discussion of the question and revealed the division of public opinion by declaring squarely on September 10th that Spain should definitely ally herself with the Entente Powers. He pointed to the agreement of 1904 on the subject of Morocco and to that of 1907 on the status quo in the Mediterranean as proof of the common interests of Spain with the Allies. Many agreed with him up to that point, but there was no sign that a large body of public opinion favored actual intervention. On the whole Spain seemed determined to adhere to neutrality, and while many favored a policy of special benevolence toward the Entente Powers within the limits of formal neutrality, the pro-German elements criticized the government as favoring that side and carried on a vigorous propaganda on behalf of Germany.

SPALDING, JOHN LANCASTER. An American Roman Catholic archbishop, died at Peoria, Ill., Aug. 25, 1916. He was born at Lebanon, Ky., in 1840, and traced descent from the English house of Lancaster. His education was obtained at St. Mary's College, Emmitsburg, Md., and at Mount St. Mary's of the West at Cincinnati. It is said that Archbishop Spalding turned to the priesthood only after his uncle, then Archbishop of Baltimore, had refused to get a dispensation to enable him to marry a cousin. His fiancée entered a convent in St. Louis, and he went abroad to study. He took the degree of doctor of sacred theology at the University of Louvain, Belgium, and gained further training at Rome. Returning to the United States in 1865, he was for four years secretary to the Bishop of Louisville and during three years built up a flourishing church among the negroes. In order to gather material for a

biography of his uncle, who had lately died, the young priest went to New York, where he remained for some years, writing and serving as chancellor of the diocese and as assistant rector of St. Michael's. He attracted such wide attention by his sermons and administrative ability that in 1877 he was appointed first Bishop of Peoria. This diocese, which then had only 51 churches, the bishop built up till, when he resigned in 1908 because of ill health, it had 250 churches, and schools and colleges besides. On his retirement he was created titular Archbishop of Scythopolis. Archbishop Spalding became known as one of the liberal leaders of his church in America. He helped to found the Catholic University at Washington and Trinity College for women, and his work toward a solution of the problems of capital and labor led to his appointment by President Roosevelt as a member of the Anthracite Coal Strike Commission in 1902. When Columbia University, in the same year, gave him the degree of doctor of laws, it was the first time a Catholic prelate had ever been so honored by the university. Some of Archbishop Spalding's writing was done under the pen name of Henry Hamilton. He published, besides the life of his uncle, already noted: *Education and the Higher Life; Aphorisms and Reflections; Religion, Agnosticism, and Education; Means and Ends of Education; Religious Mission of the Irish People; Socialism and Labor; Religion and Art, and Other Essays*; and other books, and many brochures. His Works have been published in 10 volumes at Chicago.

**SPANISH LITERATURE.** At the time of printing official statistics for Spanish literature in 1916 had not appeared, but, judging by the figures at present available, it seemed probable that the total output for 1916 would fall about 300 volumes short of the product of recent years. The *Bibliografía Española* gave a total of 1273 books up to December 1st, as against 1535 on the same date in 1915. The European war continued to hamper the importation of books, and this fact again controlled the scope of this résumé.

**CERVANTES TERCENTENARY.** The tercentenary of Cervantes's death, which occurred in 1616, caused the production of numerous studies concerning the author and his works. Only a few can be indicated: F. A. de Icaza, *De cómo y por qué "La Tía fingida" no es de Cervantes*; A. Cotarelo y Valledor, *El teatro de Cervantes* (to which the Spanish Royal Academy awarded the Berwick y Alba prize); A. Báig Baños, *La Emperatriz del mundo (Estudio sobre Dulcinea del Toboso)* and *Quién fué el licenciado Alonso Fernández de Avellaneda?*; E. Cotarelo y Mori, *Los puntos oscuros en la vida de Cervantes*; J. M. de Ortega Morejón, *Apuntes para dos obras relacionadas con Cervantes*; V. García Calderón, *Une enquête littéraire: Don Quichotte à Paris et dans les tranchées*; J. López Barrera, *Cervantes y su época*; J. Cejador y Frauca, *Cervantes . . . bibliografía crítica*; F. Climent Terrer, *Enseñanzas del Quijote*; A. Bonilla y San Martín, *Cervantes y su obra*; N. Alonso Cortés, *Casos Cervantinos que tocan a Valladolid*; and R. Ruiz López, *Guía espiritual del . . . Quijote*.

Through the efforts of King Alfonso, Archer M. Huntington (president of the Hispanic Society of America, by which a splendid Cervantes

exhibit was held), and the Marqués de la Vega Inclán, the house that Cervantes occupied in Valladolid has been acquired and restored as a Cervantes museum. In one of the lower room chapters from Cervantes are to be read every day. A printing press has also been set up in another room and Cervantes's works are to be issued therefrom.

Neither England nor Spain has forgotten that, overlooking the differences in the calendars, Shakespeare and Cervantes died on the same day, April 23rd. The British Academy and the government held a celebration in honor of both writers, and the Cervantes Chair of Spanish was established at London University. To this celebration the Spanish Academy sent its only honorary member, the Duke of Berwick and Alba; and as a return courtesy established a handsome prize for the best study of the subject: *Shakespeare en España: Traducciones, imitaciones, e influencia de las obras de Shakespeare en la literatura española*. Even without this stimulus, E. Juliá Martínez has published a large work entitled: *Shakespeare y su tiempo (historia y fantasía)*.

**LITERARY CRITICISM.** Despite all the aforesaid Cervantine activity, other forms of literary criticism showed a healthy existence. The first three numbers of the *Bulletin Hispanique* and of the *Revista de Filología Española* (both quarterly), and four of the five numbers of the Spanish Academy's *Boletín* appeared on time. The Hispanic Society of America, by issuing eight numbers, is at last up to date with its *Revue Hispanique*. All these journals have maintained their usual standards. Of scholarly studies in book form the following may be mentioned: A. Maseda, *Estudios de crítica literaria* (chiefly a keen and sympathetic study of the Gallegan poetess Rosalía de Castro); A. González Besada, *La Mujer gallega y Rosalía de Castro* (reception discourse in the Academy); M. Pérez Curis, *El Marqués de Santillana . . . el poeta, el prosador y el hombre*; R. Menéndez Pidal, *Crónica general de España* (reception discourse in the Royal Academy of History), and *Luis Vélez de Guevara: La Serrana de la Vera* (in collaboration with María Goyri de Menéndez Pidal); A. Salcedo Ruiz, *Literatura Española, Resumen de Historia Crítica* (2nd ed., wholly revised, very much enlarged, and profusely illustrated, vols. 1, 2, and 3, to the dawn of Romanticism), and *Historia de España: Resumen Crítico* (a reprint); J. Cejador y Frauca, *Historia de la lengua y literatura castellana* (vols. 3 and 4, through Philip III); A. Castro and F. de Onís, *Fueros leoneses . . . edición y estudio*; Marqués de Villa-Urrutia, *El estilo diplomático* (reception discourse in the Academy); J. de Lamano y Beneite, *El dialecto vulgar salmantino* (awarded an *accessit* by the Academy); La Real Academia Gallega, *Diccionario gallego-castellano* (fascicles 1-5); S. Calleja, *Nuevo Diccionario Enciclopédico de la Lengua Castellana* (reprint of this useful manual); Cervantes, *Obra Completas (Comedias y Entremeses, vol. 1, by R. Schevill and A. Bonilla y San Martín)*; Cervantes, *Don Quijote* (4 vols. of F. Rodríguez Marín's critical edition); Guillén de Castro, *Quien malas manas ha, etc.* (reproduction with introduction by E. Juliá Martínez); Cervantes, *Licenciado vidriera* (ed. by N. Alonso Cortés); Santa Teresa de Jesús, *Obras* (vols. i-iv; prologue by the Marqués de



San Juan de Pedras Albas); Cervantes, *Entre-meses* (by A. Bonilla y San Martín); Cervantes, *Poesías* (by Ricardo Rojas); Quevedo II, *Los Sueños* (by J. Cejador y Frauca, *Clásicos Castellanos*, vol. xxxi); Ramón de la Cruz, *Sainetes* (by Cotarelo y Mori, *Nueva Biblioteca de Autores Españoles*, vol. xxiii). Of Menéndez y Pelayo's *Obras Completas*, vol. vi, and of Juan Valera's *Obras Completas*, vol. xliii, have been reached.

**POETRY** suffered two grievous losses through the deaths of Rubén Darío (a Nicaraguan, esteemed by Spaniards as one of themselves) and Juan B. Cabrera (q.v.).

**DRAMA** gave us Eduardo Marquina's *El Gran Capitán* (produced at a benefit performance by and for María Guerrero); J. M. Ortega Morejón's *El Protector de Inglaterra*; vol. xxii of the *Teatro* of Jacinto Benavente, together with a new play *La Ciudad Alegre y Confiada* (an exquisite allegorical drama treating the general question of national civic preparedness as against personal selfishness); I. Sánchez Estevan's *Rita Luna*, *comedia dramática* (awarded a prize by the City Council of Madrid); and nearly a dozen plays by the Alvarez Quintero brothers.

**NOVEL.** The most important novel of the year was Vicente Blasco Ibáñez's *Los Cuatro Jinetes del Apocalipsis*, dealing with the present war, but with a sanity of judgment and a breadth of view seldom found in war literature. The scene is laid in Argentina, Spain, France, and Germany.

**THE SPANISH ROYAL ACADEMY.** Too late for mention in the 1915 YEAR BOOK, occurred the death of Juan Menéndez Pidal, who had been in possession of his chair only a few months. Francisco Fernández de Bethencourt (Spain's greatest genealogist, and author of the monumental *Historia genealógica y heráldica de la monarquía española: Casa real y Grandes de España*, of which nine quarto volumes had appeared) died in April; and in September the Academy lost José Echegaray (q.v.). Of the members-elect the following had taken their seats: the Marqués de Villa-Urrutia (the diplomat), Miguel Echegaray (younger brother of José Echegaray and himself the author of more than 100 plays), and Augusto González Besada. The Academy awarded the Fastenrat prize to Alejandro Pérez Luján for his novel *La casa de la Troya*. The Academy honored the tercentenary of Cervantes's death by establishing a quinquennial Cervantes Prize of 10,000 pesetas and 500 copies of the book that should win the prize, said book to be published at the Academy's expense. The topic to be treated this time is *Vocabulario general de Cervantes*, and in order to facilitate the work of the competitors, the Academy is proceeding to make photographic reprints of first editions of all of Cervantes's works.

**SPANISH PHILOLOGY.** See PHILOLOGY, MODERN.

**SPANISH ROYAL ACADEMY.** See SPANISH LITERATURE.

**SPECHT PRIZE.** See GERMAN LITERATURE, Miscellaneous.

**SPECTROSCOPY.** See ASTRONOMY; PHYSICS.

**SPIERING, THEODOR.** See MUSIC, Artists, Instrumentalists.

**SPIRITS, DISTILLED.** See LIQUORS.

**SPIRITUALISTS' ASSOCIATION, NATIONAL.** This association, which was incorporated in 1893 to unite local Spiritualist societies of the United States, had, in 1916, 1000 local working societies. There were 22 State associations, 500 other local societies, and 32 camp meeting associations. The 200 churches and temples, together with camp meeting property, were valued at \$6,000,000. The number of ordained ministers was 500, of public mediums 1500, and of adherents about 600,000. At the annual convention of the association held in October, 1916, at St. Paul, Minn., the most important projects discussed were a national temple to be erected in Washington, D. C., and a propaganda endowment fund. It was decided to hold the 1917 convention in New York City. The officers of the association are: President, George D. Warne; secretary, George W. Kates; and treasurer, Cassius L. Stevens.

**SPORTS.** See articles on ATHLETICS, BASEBALL, FOOTBALL, RACING, ROWING, etc.

**SPOTTED FEVER.** See ROCKY MOUNTAIN SPOTTED FEVER.

**SPRAYING.** See BOTANY; HORTICULTURE.

**SQUASH.** See RACQUETS.

**STAGE SOCIETY OF NEW YORK.** See

DRAMA, *passim*.

**STANDARD OIL STRIKE.** See STRIKES AND LOCKOUTS.

**STANDARD TIME.** See DAYLIGHT SAVING.

**STANLEY, SIR ALBERT.** See GREAT BRITAIN, Government.

**STANLEY, WILLIAM.** An American electrical engineer, died at Great Barrington, Mass., May 14, 1916. He was born in Brooklyn, N. Y., in 1858, and studied at Williston Seminary and for a short time at Yale, but in electrical science he was self-educated. Between 1885 and 1903, he served as chief engineer of the Westinghouse Electric Company, the Stanley Electric Manufacturing Company, and the Stanley Instrument Company. At 32 he invented an alternating current device which made possible the transmission of electric light and power to long distances, and soon afterward he invented an electrical transformer which came into general use. Mr. Stanley was at one time vice-president of the American Institute of Electrical Engineers, and he was elected to membership in the Institution of Electrical Engineers, London. He was a recipient of the Edison medal for distinguished contributions to electrical science.

**STARS.** See ASTRONOMY.

**STATE BANKS.** Like other kinds of banking institutions State banks experienced a remarkable development during 1916. If one includes under this term what are commonly called State banks as well as savings banks, loan and trust companies, and private banks, their total number on June 30, 1916, according to the Report of the Comptroller of the Currency, was 19,934. They had aggregate resources of \$18,344,000,000. Of this, loans and discounts comprised \$10,164,000,000; investments in bonds and securities, \$4,443,000,000. The principal item of liabilities was individual deposits of \$14,730,000,000.

Regular commercial State banks numbered 15,450 in this report, but this included the stock savings banks of Virginia, South Carolina, Tennessee, Michigan, Wisconsin, North Dakota, Kansas, Montana, Idaho, and Nevada, as well as the trust companies of Virginia, North Carolina,

South Carolina, Tennessee, Idaho, and Nevada, and the private banks of North Carolina and Idaho. Their total resources were \$5,553,000,000, including loans and discounts of \$3,407,000,000; investments of \$693,000,000; checks, clearing house exchanges, and cash on hand, \$404,016,000. The principal item of liabilities was \$4,296,000,000 of individual deposits. Their capital was \$63,497,000; surplus, \$268,821,000; and undivided profits, \$91,152,000. Under the revised law State banks may receive deposits from the postal savings system, and on June 30th they held \$4,457,000 of such deposits.

The number of loan and trust companies exclusive of those included in the foregoing was 1606. Their total resources were \$7,028,000,000, including loans and discounts of \$3,704,000,000, investments of \$1,605,000,000, and checks, clearing house exchanges, and cash on hand of \$439,447,000. These banks held individual deposits of \$5,198,000,000; and postal savings deposits of \$4,826,000. Their paid-in capital was \$475,000,000; their surplus, \$508,000,000; and undivided profits, \$96,669,000.

The 1014 private banks reported by the Comptroller on June 30 had total resources of \$181,852,000, of which loans and discounts amounted to \$117,715,000. They held individual deposits of \$146,765,000. See SAVINGS BANKS and BANKS AND BANKING.

**STATEN ISLAND GARBAGE DISPOSAL.** See GARBAGE AND REFUSE DISPOSAL.

**STATISTICAL ASSOCIATION, AMERICAN.** This organization held its 78th annual meeting at Columbus, Ohio, December 27th-29th. For its joint sessions with other bodies, see *American Economic Association* under POLITICAL ECONOMY. At the special sessions of this association the following papers were read and discussed: "Comparative International Statistics," by Royal Meeker, United States Bureau of Labor Statistics; "Utilization of Statistics in Business," by Julius H. Parmelee, Bureau of Railway Economics; "The Increasing Mortality After 45,—Some Causes and Explanations," by Louis I. Dublin, Metropolitan Life Insurance Company; and "Do the Statistics Regarding the Concentration of Wealth in the United States Mean What They Are Commonly Assumed to Mean?" by Allyn A. Young, Cornell University, Willford I. King, University of Wisconsin, Davis R. Dewey, Massachusetts Institute of Technology, and George P. Watkins, Public Service Commission, New York City. Special sessions were devoted to the discussion of proposals for undertaking practical work, and to special problems growing out of the European war. See POLITICAL ECONOMY.

**STATISTICS.** See sections in articles on various countries and States of the United States; also VITAL STATISTICS.

**STATUE OF LIBERTY.** See ELECTRIC LIGHTING.

**STEAM DRIVEN AUTOMOBILES.** See AUTOMOBILES.

**STEAM ENGINES.** The most striking feature of 1916 was the position that was being gained by the uniflow engine, a modern type with cylinder so designed that on entrance the steam masses into it with maximum effect and acts correspondingly on the exhaust, so that there is minimum change of direction of flow as compared with the older types. It was stated during the year that when worked non-condens-

ing or with vacuums up to 28 inches and in units of less than 1000 kilowatts the uniflow engine was more economical than the steam turbine. As a result it was beginning to find use in refrigeration and in the power plants of iron and steel works. In fact the uniflow engine could be direct connected to the rolling mill and unless the plant was so large and the loads so heavy that turbo-generator units of over 8000 kilowatts capacity could be installed, it was more efficient than the steam-turbine electric drive. These uniflow engines were installed in Germany in considerable numbers, and the largest was said to have a continuous capacity of 6300 horse power and be capable of working to 8000 horse power on peak load. This engine drives a 30-inch 3-high mill. In the United States the first uniflow engines for rolling mill work were building for the Youngstown Sheet and Tube Co. One was to have a steam cylinder 44 x 50 inches and operate at a speed of 110 revolutions per minute. Its capacity would vary from 700 to between 3000 and 4000 horse power. The second engine had a cylinder 37 inches in diameter with a 48-inch stroke. The engines would use steam at approximately 170 pounds pressure, 75 degrees superheated, and 20 inches of vacuum in barometric jet condensers. See also STEAM TURBINES.

**STEAMSHIPS.** See BATTLESHIPS AND OTHER WAR VESSELS; SHIPBUILDING; SHIPPING; UNITED STATES AND THE WAR; WAR OF THE NATIONS.

**STEAM TURBINES.** The demand for turbo-generators of ever greater capacity continued in 1916, and several units far exceeding the record size 35,000 kilowatt machines of but a year or two previously were ordered or under construction. The Interborough Rapid Transit Co. of New York City had ordered two 60,000 kilowatt Westinghouse 3-cylinder, 2-stage, 3-generator units, which represented a distinct advance not only in size but in practice. Each of these units was designed with a high pressure element flanked on either side by a double flow low-pressure turbine. Thus there are three individual units which may be worked singly, together, or in any desired combination, and the shutting down of one does not cut out of service the unit as a whole. Economy is secured in operation, though not in original cost, and there was naturally increased flexibility, even though this was attended by more complicated mechanism. The great advantage claimed for the arrangement was that by affording four paths to the exhaust steam from the high pressure element large areas were provided for the low pressure steam in considerable volume, and it was able to act most effectively. A notable 50,000 kilovoltampere turbo-generator was ordered during the year by the Detroit Edison Co. from the General Electric Co., and was a single turbine of single-flow design, direct connected to a single generator. This was in several ways a record machine. Not only was more power produced from a machine in one casing than from any other single turbine, but it was to have the largest condenser built up to that time, of the single-pass type, with 70,000 square feet of surface and provided at either end with a circulating pump requiring 450 horse power for its operation. Another notable turbine unit of the year was a Westinghouse cross-compound tur-

bine of 45,000 kilowatts capacity for the Narragansett Electric Lighting Co. of Providence. This had a single-flow straight reaction type high pressure element, and at the low-pressure end a double flow turbine with eight groups of blades on either side and each side exhausting into a separate jet condenser of the Westinghouse-Le Blanc low head type. A 35,000 kilowatt single casing turbine was ordered by the Boston Elevated Railways Co. and was built under a guarantee of 10.65 pounds of steam per kilowatt hour when developing 25,000 kilowatts, although such a performance was said to be not uncommon with large turbines of 30,000 kilowatts capacity and over. The general tending was to work to higher steam pressures, 300 and 350 pounds being used in turbines installed or under construction during the year, and pressures as large as 500 to 1000 pounds being considered. Mechanical engineers were alive to the high costs of fuel during the year and increased economy was the aim of all new power plant installations and equipment. See DYNAMO-ELECTRIC MACHINERY.

**STEEL.** See CHEMISTRY, INDUSTRIAL; IRON AND STEEL; METALLURGY.

**STEFANSSON, VILHJALMUR.** See POLAR RESEARCH, *Arctic*.

**STEIN, SIE AUREL.** See EXPLORATION, *Asia*.

**STEPHENS, JAMES.** See LITERATURE, ENGLISH AND AMERICAN, *Poetry*, English.

**STERILIZATION.** See INSANITY.

**STERNHEIM, CARL.** See GERMAN LITERATURE, *Fiction, Drama, and Miscellaneous*.

**STEVENS INSTITUTE OF TECHNOLOGY.** A non-sectarian technical institution for the education of men at Hoboken, N. J. It was founded in 1870. The total registration in the fall of 1916 was 540. The faculty numbered 37. Productive funds amounting to \$1,500,000 yielded an income of \$67,540. There were 11,500 volumes in the library. During the year two acres of land adjoining the main buildings of the institute were acquired at a cost of \$110,000. A new gymnasium was completed. President, Alexander Crombie Humphreys.

**STEWART, SAM V.** Relected Democratic Governor of Montana Nov. 7, 1916. See MONTANA.

**STEYN, MARTINUS THEUNIS.** A South African statesman, the last president of the Orange Free State, died at Bloemfontein, Orange River Colony, Nov. 29, 1916. He was born at Winburg, Oct. 2, 1857, and was educated at Grey College, Bloemfontein, and in Holland, after which he studied law at the Inner Temple, London, and was admitted to the bar in 1882. Returning to the Orange Free State, he was appointed state attorney in 1889, the same year was elevated to the bench as second puisne judge, and in 1893 was appointed first puisne judge. In 1896 he was elected by universal suffrage president of the Orange Free State Republic. His policy was to draw the two Boer republics closer together, and the defensive alliance agreed upon by the Transvaal and the Orange Free State in 1897 was heartily supported by him. In 1899 he represented the Orange Free State in the conference at Bloemfontein with Sir Alfred (now Lord) Milner and President Paul Kruger in an effort to settle the difficulties between the British and Boers. The effort failed, and upon the outbreak of the war Steyn called out the Orange Free State troops

to cooperate with those of the Transvaal. In May, 1900, after the British annexation of the Orange Free State by proclamation, he issued a counter proclamation affirming the State's independence. When Kruger left the Transvaal for Europe Steyn became the virtual chief of the Boer forces. He took part in the peace conference that led to the close of the war in 1902. While always ready to promote Boer interests in the Orange River Colony under British rule, he did not take an active part in political life, but spent most of his time in farming.

**STICKNEY, ALPHEUS BEEDE.** An American lawyer and railroad builder, died in St. Paul, Minn., Aug. 9, 1916. His early life was spent in New England. He was born at Wilton, Maine, in 1840, taught school and studied law, and was admitted to the bar at 22. Early removing to Minnesota, he became interested in new railroads, first as a lawyer and later as a capitalist. Mr. Stickney was best known for his connection with the road which developed into the Chicago Great Western. Of this he began construction in 1883 as the Minnesota and Northwestern, and he served as its president until it was consolidated with the Chicago, St. Paul, and Kansas City, then was president of the road under the latter name, and from 1892 to 1900 was chairman of the board of directors. During this last period the road became the Chicago Great Western. In 1908-09 he was its receiver. His charge that certain railroads were guilty of evading the rebate law was responsible in 1909 for an investigation by the Interstate Commerce Commission. Mr. Stickney's interests, in addition to railroads, included the St. Paul union stock yards and packing houses, which he built in 1882.

**STILGEBAUER, EDUARD.** See GERMAN LITERATURE.

**STOCK EXCHANGE.** See FINANCIAL REVIEW.

**STOCKHOLM PEACE CONFERENCE.** See INTERNATIONAL PEACE AND ARBITRATION.

**STOCK RAISING AND MEAT PRODUCTION.** The European war has brought forcibly to the attention of all meat-consuming countries the importance of the animal industry to the common welfare. The presence of many million men in the European armies, engaged in an occupation which calls for enormous quantities of food, without a compensating return in production, has caused an acuteness in the shortage of meat the world over which is greater than any known in the memory of persons now living. It is probably true that the soldiers now fighting in Europe are enjoying a larger amount of meat in their daily rations than they were accustomed to before the war broke out, and it is probable that the appetite for meat which these men have acquired will have a considerable effect upon the world demand for meat after peace is declared.

The leading meat exporting countries of the world are: Argentina, Australia, the United States, and South Africa. In none of these countries has there been a very large increase in recent years in the number of cattle on farms. In the United States the total number of cattle reported on Jan. 1, 1916, was 61,000,000, the same as reported by the census of 1910. Australasia, including only Australia and New Zealand, reports the largest number of sheep

of any section of the world, but there has been no increase recently. The United States is the principal swine producing section of the world, and the greatest exporter of pork products. The number of swine in the United States appears to be increasing rapidly, 68,000,000 being reported on Jan. 1, 1916, an increase of almost 4,000,000 over the year previous, and an increase of 10,000,000 over the census of 1910.

As to the possible development of new sources of supply of meat animals, considerable progress is being made in the development of the cattle industry of South America, and recently steps have been taken to develop this industry in Brazil. Official figures seem to show that the Brazilian cattle industry is progressing favorably. The first actual exportation of refrigerated beef from Brazil was in November, 1914, when a shipment of only a little over 1000 kilos was sent from Santos to Great Britain. There are now, however, a number of meat packing establishments in that country. Refrigerated meat exports during the first four months in 1916 are reported by the consul-general of the United States at Rio de Janeiro at 6,228,209 kilos, compared with 345,513 kilos for the corresponding period of 1915. The value of these shipments is reported at \$1,210,005 and \$54,025 respectively. Practically all of this meat went to France and Great Britain. Brazil has always been an important exporter of jerked beef, but this product is almost entirely consumed in South America. The entrance of this country into the refrigerated beef industry is a factor of importance which should not be overlooked. It is also interesting to note that a small meat packing company has been organized in Paraguay and a plant is to be erected at Asuncion.

**THE HORSE INDUSTRY.** Interest in the horse industry has been greatly aroused during the progress of the war, on account of the large purchases made by the Allied governments for military purposes. Accurate figures show that since the war was declared, over 900,000 head of horses and mules have been exported from the United States alone to Europe and Canada, practically all of which were for military purposes. The United States and Russia combined possess far the largest number of the world's horses, and those of the United States are of a much higher quality and are more useful than those of Russia. The export trade in horses from the United States during the past two years has not had any serious effect on the horse market. The horses taken have been largely of an ordinary grade, and few mares have been exported, practically none of which were breeders. The effect of motor trucks on the horse industry can be seen in almost any city, but it is a fact that good draft horses command as high prices as ever for city use. The farm demand for horses is as strong as ever, and mechanical traction has not as yet seriously affected that market.

**EXPORTS OF MEAT AND MEAT PRODUCTS.** The exports of meat and meat products from the United States have tremendously increased since the outbreak of the European war. In point of value, there has been an increase of almost 100 per cent. The value of the export of meat products during the fiscal year preceding the outbreak of the war was, in round numbers, \$143,000,000. In the fiscal year 1916 the

value was slightly less than \$267,000,000. This trade has been to a considerable extent at the expense of consumption in the United States. During the fiscal year 1914 less than 7,000,000 pounds of fresh beef were exported. During the fiscal year 1916 the amount shipped abroad was over 231,000,000 pounds.

Roughly speaking, about 60 per cent of the animals slaughtered for food in the United States are killed at abattoirs having Federal inspection, the remainder being slaughtered at local plants doing an intrastate business, where Federal inspection is not maintained, and on farms. In the fiscal year 1916 the number of cattle slaughtered under Federal inspection was 217,000 less than in 1907, although the slaughter in the year 1910 exceeded that of 1907 by over 300,000 head. The slaughter of swine has increased tremendously, and the indications are that the fiscal year 1917 will show a considerable increase over 1916. The increase in slaughtering of swine from slightly less than 32,000,000 head in 1907 to over 40,000,000 head in 1916, bears strong witness to the great increase in the swine industry throughout the country. Sheep slaughtering were also considerably larger than in 1907. A rapid increase in the slaughter of sheep from 1907 to 1914, and especially from 1911 to 1914, was largely due to the disposal of sheep on the passage of the tariff law placing wool on the duty free list. A world shortage in wool and increased prices for sheep in the United States have automatically checked this practice, and slaughtering of sheep have decreased in the last two years.

The slaughter of calves does not seem to be alarming on the face of the official Federal inspection reports, the number in the year 1916 having been exceeded in a number of previous years.

**THE DEVELOPMENT OF THE HOG INDUSTRY IN THE UNITED STATES.** One of the most interesting features of agricultural development in the United States during recent years has been the rapid spread of the hog industry into sections in which it was not formerly a factor. Reports to the Department of Agriculture of the number of swine on farms Jan. 1, 1916, show that in 14 States the number was 10 per cent or over above that reported on Jan. 1, 1915. Of these States, only two were corn belt States. The development of the industry in other sections shows the realization by farmers of the profit of hog raising in agriculture and the determination of the people in those sections to develop home-grown sources of pork products.

During the year the local packing plants recently established in Southern States have continued to flourish, and numbers of others are being built or projected. There is also quite a development there in municipal abattoirs, maintained by the municipality, where local butchers may slaughter animals under inspection, with all the facilities of a modern abattoir.

The agricultural extension movement is undoubtedly responsible for most of this increase in hog raising. In the Southern States the Pig Club movement has had a profound effect.

**THE SHEEP AND WOOL INDUSTRY.** Considerably to the surprise of wool growers, the expected did not happen when wool ultimately was placed on the duty free list on Dec. 1, 1913. A world shortage of wool developed, particularly in wool of grades produced in the United

States, commonly known in the trade as "cross-bred" wools. Prices held firm and sheep men soon ceased disposing of their flocks. The outbreak of the European war intensified this shortage and the demand for wool has sent prices to a higher level than in many years. The action of the British government recently reported, in placing a practical embargo on the entire Australian clip of the year 1916, has aggravated this condition, and prices are still advancing. In addition to the shortage in wool production, the people of the United States have been developing an appetite for lamb and mutton, and this has broadened the outlet for mutton-bred lambs from the range.

At the same time, a determined campaign has been in progress throughout the range States for the improvement of methods of handling wool on the range. A number of modern sheep shearing sheds have been erected in the range country, where wool is classed systematically and baled according to the best known methods.

One of the most remarkable features of the development of the sheep industry in the country is the growing interest in the rehabilitation of sheep raising on farms. A conference was held at Philadelphia in November, 1916, under the auspices of the Philadelphia Wool and Textile Association, at which representatives of various interests concerned with the development of the farm sheep industry were present. A systematic plan was drafted for a propaganda campaign to cover the farming States.

**THE CATTLE INDUSTRY.** The outstanding feature of the cattle industry during the year has been the high prices obtained by cattle raisers. Prices of fat cattle have ruled at a very high figure, and feeders as a rule have found their operations profitable. A shortage in the corn crop, however, has tended to reduce the price of feeders somewhat, and it is possible that a smaller number of cattle will be fed in the corn belt during the winter of 1916-17 than a year ago. The future of the beef cattle industry in the corn belt has been a matter of grave concern for some time, on account of the high price of land and grain and the speculative character of the conventional cattle feeding operations. A report issued by the United States Department of Agriculture during the year emphasized the surer element of profit in the raising rather than in the fattening of cattle. It shows that the production of baby beef where calves are fattened out at an age of about 15 months is profitable, but farms where cattle are raised and fattened out at ages of from two to three years, show a loss on their feeding operations. The report presents significant figures on the profits made where each cow is allowed to nurse two calves, and the Department regards this as of sufficient importance to warrant further study of this phase of the subject.

The extension of the beef cattle industry in Southern States goes on rapidly. Excellent progress is being made in the campaign to eradicate the Texas fever cattle tick, and the follow-up work of national and State agricultural forces is being effectively prosecuted. Herds of breeding animals have been established in territory which but a few years ago was tick infested and the breeding of improved cattle unprofitable on this account.

The establishment of a rational and economic system of cattle raising in the corn belt and the development of the industry in the Southern territory as a consequence of the tick eradication campaign seem to be the most promising lines of development.

Breeders of pure-bred live stock in the United States are enjoying a greater prosperity than has ever been known in the country.

An event of more than ordinary importance to American live stock breeders was the interchange of judges between the Sociedad Rural Argentina of Buenos Aires and the International Live Stock Exposition of Chicago. The latter show was held for the first time in several years, on account of the prevalence of foot-and-mouth disease.

**STOCKS AND BONDS.** See FINANCIAL REVIEW.

**STOMATOLOGY.** The importance of oral infection as a source of general disease is receiving more and more attention. Focal infection about the teeth occurs, according to one observer, in from 69 to 89 per cent of all individuals, the majority of these being connected with chronic abscesses in the roots of the teeth or in the root canals. Dr. Frank Billings, of Chicago, lays down some of the principles involved in focal infection as related to systemic diseases, and discusses the subject under three headings: (1) The pathogenic micro-organisms involved and the conditions which modify their virulence of activity. (2) The infected individual and the conditions which modify his susceptibility to infection. (3) The nature and result of the reactions between the infected agents and the tissues of the host.

The pathogenic micro-organisms which may cause infectious diseases are numerous, comprising fungi, protozoa, and bacteria, the latter being the most important of these. The members of the streptococcus group, together with pneumococci, staphylococci, colon bacilli, diphtheria, and tubercle bacilli, are most frequently implicated. All of these bacteria may be found on the skin and on the mucous membranes of the tonsil, pharynx, and nose, as well as in the mouth, where they may exist simply as parasites without producing disease in the host, who, either through acquired immunity or natural resistance, acts merely as a carrier. Such micro-organisms, however, if transmitted to a new host and a new soil more fitted for their development, may produce their characteristic lesions; or the original host, if subjected to conditions which lower his resistance, may become himself the victim of their activities.

Among the streptococci which may, under favorable conditions, produce lesions in other parts of the body are *S. hemolyans (longus)*, *S. mucosus*, and *S. viridans*. The latter, so-called because of the green color it produces when growing in colonies on blood-agar medium, is ordinarily mildly pathogenic, and is a very common inhabitant of the mouth and tonsils; but under favorable conditions it may become actively pathogenic, attacking especially the endocardium, where it may give rise to enormous vegetations on the heart valves. *S. hemolyans* occasionally migrates to the subcutaneous tissues, producing a variety of erysipelas. The effects of the tubercle bacillus, pneumococcus, and the pus-producing staphylococcus are well known. A most important factor in the ques-

tion of focal infection is the immunity of the individual. Man possesses a natural immunity to infection which may vary in degree, but is never absolute.

The versatility with which an individual is infected depends not only on the characteristics of the infectious agent, but on peculiarities of the host. These peculiarities again depend on age, environment, occupation, climate, sanitary habits, etc., and possibly on heredity. The lymphoid tissue of a child, especially in the nose and pharynx, is relatively excessive, and therefore children are comparatively more susceptible to contagious diseases and subject to tonsillitis, catarrhal disturbances, and suppurative conditions of the ears. From these foci of infection the lymph glands about the neck may become enlarged and diseased and later may serve as additional sources of systemic infection. Occupations which entail exposure to excessive fatigue also lower the resistance, as do conditions of mental stress and chronic worry.

The practical lessons which may be drawn from these investigations lead back to personal immunity and hygiene. The individual who wishes to avoid disease must keep up his resistance against infection to the highest point by attention to the rules of hygiene, including diet, exercise, and the like; and at the same time, when focal infection appears about the upper respiratory tract, or the teeth, he must have it eradicated promptly, before the issues are extensively diseased and micro-organisms obtain entrance to the lymph or blood stream, through them to be deposited in other portions of the body which may be vulnerable.

**STORAGE BATTERIES.** See ELECTRICAL BATTERIES.

**STORIES.** See LITERATURE, ENGLISH AND AMERICAN; and articles on French, German, Italian, Russian, and Scandinavian Literatures.

**STORM, THEODOR.** See GERMAN LITERATURE, *Biography* and *New Editions*.

**STRACHAN-DAVIDSON, JAMES LEIGH.** An English educator and classical scholar, died at Oxford, March 29, 1916. The son of an East India merchant who acquired homes in Perthshire and Surrey, he was born in 1843 and was educated at Leamington College and at Balliol College, Oxford, of which, after his graduation in 1866, he became a fellow, and where he was appointed lecturer (1873), sub-dean (1874), and dean and classical tutor (1875). In 1893, when the famous Jowett died, it was expected that Strachan-Davidson would be appointed his successor as master of Balliol. Instead, the post was given to Dr. Edward Caird; but when Caird retired in 1907 it went to Strachan-Davidson. From 1906 he held one of the two Jowett fellowships. As a scholar, he devoted himself to the study of Roman history, a field in which he did notable work, publishing *Selections from Polybius*; *Appian, Civil Wars*, Book I; articles on the Roman constitution in *Smith's Dictionary of Antiquities*; "Life of Cicero," in *Heroes of the Nations Series*; and *Problems of the Roman Criminal Law*. But it was as one of the most popular of Oxford teachers and for his work as dean that he was best known. In 1915, then a pro-vice-chancellor of Oxford, he took his seat on the hebdomadal council. He received the honorary degree of LL.D. from St.

Andrews and Glasgow, and that of D.C.L. from Oxford.

**STRAITS SETTLEMENTS.** A British crown colony of Malaysia, composed as follows: the island of Singapore, 217 square miles, with its dependencies—the Cocos (or Keeling) Islands, about 20 in number (no definite area given), Christmas Island, about 62 square miles, Labuan, 28½ square miles (total population of Singapore and dependencies, census of 1911, 311,985); Penang, 108 square miles, with province Wellesley, about 208 square miles, and the Dindings, about 183 square miles (total population, 278,003); Malacca, 720 square miles (population 124,081). Total area, between 1600 and 1650 square miles; total population, 714,069. Estimated population 1915, 778,160. Chief town of Singapore, Singapore; of Penang, George Town; Malacca, Malacca. Capital of the colony, Singapore. The ports are free. The trade is chiefly transit, the only articles produced for export in the colony being tapioca, rice, rubber, sugar, and coal (from Labuan). The table below shows trade and finance statistics in Straits Settlements dollars and shipping in tons entered and cleared (the Straits Settlements dollar is equivalent to about 56.77 cents):

	1909	1911	1914
Imports . . . . .	318,358,427	398,034,421	391,373,123
Exports . . . . .	281,183,021	341,889,822	334,126,020
Revenue . . . . .	8,795,001	11,409,221	14,016,882
Expenditure . . . . .	8,524,731	9,085,389	10,180,188
Shipping . . . . .	22,192,354	24,086,904	24,859,917

The railways are operated by the Government of the Federated Malay States.

**STRATIGRAPHY.** See GEOLOGY, *Stratigraphy*.

**STRAUSS, RICHARD.** See MUSIC, *Novelties and Germany*.

**STRAVINSKY, IGOR.** See MUSIC, *Novelties*.

**STREETS.** See ROADS AND PAVEMENTS.

**STRIKES AND LOCKOUTS.** The year 1916 witnessed an unusual number of labor disturbances, especially in the United States, but neither here nor abroad were there many strikes of momentous character. The threatened strike of railway employees was settled by the enactment of the Adamson law (see ARBITRATION AND CONCILIATION, INDUSTRIAL; and RAILWAYS). According to the *Monthly Review* of the Bureau of Labor Statistics the number of strikes and lockouts during the first 10 months was 2890, as compared with 1025 in the same months of 1915. The number of strikes reported as beginning in January was 156; the number increased each month until May, when 515 were reported. Thereafter the number declined to 193 in October. The variety of strikes is indicated by the following list of the more important strikes begun in October: street car men in New York City, Albany, and Springfield (Mo.); employees of the Standard Oil Company at Bayonne; miners of Pennsylvania, Oklahoma, and Michigan; machinists in St. Louis, New York, Boston, Baltimore, Portland, and Wilmington; tailors in Minneapolis, St. Paul, and Cincinnati; tobacco workers and stevedores in Porto Rico; street car men and dredgers in the Canal Zone; iron workers at San Francisco; shipbuilders at Elizabeth (N. J.); molders at Rochester; and messenger boys, window clean-

ers, grocery clerks, cigar makers, neckwear workers, macaroni workers, and hod carriers in New York City. Of the 321 strikes begun in October, 61 were in metal trades; 38 among miners; 34 in the building trades; 16 in clothing; 16 among teamsters; 11 among textile workers and from 5 to 9 among each of the following: street railway men, bakers, tobacco workers, waiters and cooks, food handlers, chemical workers, glass-blowers, paper makers, butchers and meat-packers, freight-handlers, longshoremen, musicians and theatre men, and steamboat men. Of these October strikes 103 were for better wages; 31 for shorter hours; 20 for recognition of the union; 12 for recognition and better wages; 16 because of the discharge of employees; and 23 because of non-union employees. Of the 321 strikes nearly all were in the following States: Pennsylvania, 47; New York, 32; Missouri 29; Massachusetts, 26; Ohio, 23; Illinois, 18; New Jersey, 16; Connecticut, 17; and California, 12. Only a few strikes can be individually described.

**DAIRY FARMERS' STRIKE.** Perhaps the most unique strike of the year was that in the first week in October of the Dairymen's League of New York State. Its members struck against the great distributing companies of New York City which stand between the milk producers and the retail and small wholesale dealers. The Dairymen's League of 17,000 organized farmers demanded a six months' contract with the milk dealers with an advance in price to the farmers of 45 cents a hundredweight of milk. The large dealers, on the other hand, while agreeing to an increase in price, limited it to the month of October; this contract, however, the dairymen refused to accept. The great distributing agencies, such as the Borden and Sheffield companies, held out against the league's demands because they insisted that, having encouraged sanitation and secured extra prices for high grades of milk and cream, they had practically made the market what it is. They also refused to deal with the league instead of the farmers individually, contending that it would lower standards and harm both farmers and dealers. Several of the smaller dealers, however, early accepted the full demands of the dairymen, including the six months' contract. Some violence was shown by pickets of the league in seizing milk cans of "scab" farmers and emptying them on the road. But the strike was finally ended late in October, with a victory for the dairymen, when the Borden Company, which had held out the longest, agreed to accept the milkmen's terms.

**GARMENT WORKERS.** Notwithstanding attempts made by Mayor Mitchel and Jacob H. Schiff to arbitrate through the Council of Conciliation the differences arising between employers and employees in the clothing industry, a lockout was ordered by the Cloak, Suit, and Skirt Manufacturers' Protective Association in New York City, April 29th. Since the manufacturers had abrogated the peace protocol in the summer of 1915, relations between them and the workers had been strained, and when on March 3rd the employers refused to accept certain rulings of the Council of Conciliation, the various locals of the International Ladies' Garment Workers' Union announced that it was no longer able to deal with the association. This ended all contractual relations between the un-

ion and the association and, besides the 60,000 workers in 409 shops who were rendered jobless by the lockout, several thousand workers in 1600 smaller shops operated by sub-contractors were called out in the strike. However, a break came in the strike on May 7th when some 7000 workers returned to factories of 25 independent manufacturers who had settled satisfactorily with the union. On May 22nd, pamphlets denouncing the union leaders were mailed by the cloak manufacturers to the 3000 operatives who were locked out. On May 26th, by the resignation of Rabbi J. L. Magnes, Dr. Henry Mosikowitz, and C. L. Bernheimer as members of a board of moderators in the men's garment industry, a crisis was reached, because in the women's garment industry, the Council of Conciliation headed by Dr. Felix Adler had resigned a few days before the lockout. These latter resigned because the manufacturers refused to arbitrate, whereas the board of moderators resigned because they said the union refused to stand by the agreement it had signed. In a report issued late in May by a group of eminent political scientists and economists, including Henry R. Seager, John Dewey, Franklin H. Giddings, Samuel McCune Lindsay, and Robert Livingston Schuyler, the responsibility for the lockout of April 29th was placed upon the shoulders of the executive committee of the Manufacturers' Protective Association.

On May 31st the Cloak and Suit Manufacturers' Association rescinded the lockout order and invited the workers to return to work on the employers' terms, but this the workers refused to do. In June members of the association declined to attend a conference arranged by a citizens' committee for the purpose of settling differences through arbitration. Stating that many plants had been established in neighboring States, members of the association declared that a large number of them would leave New York City if the strike continued. However, on July 10th at a meeting in the city hall, Mayor Mitchel presiding, representatives of the association and union agreed to begin negotiations for a settlement. But being unable to reach a complete agreement by July 12th, Samuel Gompers, president of the American Federation of Labor, was summoned by a joint call to assist in making terms favorable to the two sides. But on July 20th, no decision having been reached, President Wilson referred a petition asking the appointment of mediators to the Department of Labor. Then, fearing that Federal intervention would lessen the employers' chances of obtaining their demands, more than two-thirds of the manufacturers insisted that an agreement be reached in order to save them from ruin. Two days' secret meetings between the leaders of both sides followed. On July 26th the agreement was presented to the men for ratification, but it was refused on the ground that they had been sold out by their leaders. The men were then given until August 2nd by the employers to accept terms, and on the first of August 45,000 strikers ratified the agreement which had already been approved by the general strike committee and 500 shop chairmen; this decision was reached without government intervention, although on July 31st, the Labor Department had appointed a board of three conciliators.

The agreement finally reached was as follows:

an increase of 55 cents to \$1.50 per week in wages; a working week reduced from 50 to 49 hours; preferential union shop; and right of manufacturers to discharge any employee for cause. Thus the unions obtained their demand for preferential shop and right to strike, and the manufacturers their demand of right "to hire and fire," these two contested points being the cause of the strike.

**ANTHRACITE COAL MINERS.** The demands of anthracite coal miners for recognition of the union, the eight-hour day, and 20 per cent more pay were refused on February 3rd by the operators on the ground that shortage of coal and prohibitive prices would result. But a subcommittee of miners and operators on April 30th reached an agreement as to working hours and wages which on May 1st was approved by the Tri-District Committee representing the United Mine Workers of America in the anthracite mining districts. On August 27th, 16,000 anthracite miners voted to return to work the following day, having tied up the collieries of the Philadelphia and Reading and Susquehanna Coal Company in Shamokin, Pa., for 11 days. The strike was made in an effort to unionize the mines, which was successful.

**BITUMINOUS COAL MINERS.** On March 7th an agreement was reached on a scale for two years between Eastern soft coal operators and a committee of the United Mine Workers of America. The men failed to get several of their demands, namely, a four-year contract, an eight-hour day applying from time of entrance to shaft till time of leaving, and a weekly pay-day instead of two per month. But there was an increase of pay of 5.39 cents per ton in western Pennsylvania, 3½ cents in Indiana, and 3 cents in Ohio and Illinois. The advanced scale affected more than 500,000 men. A 5 per cent advance was granted to men working by the day in yardage, dead work, and broom turning. It was further agreed that district conventions were to settle all local disputes except those of raising wages or cost of coal production. On April 11th a wage agreement between the officials of the United Mine Workers and representatives of local mine owners in New York was ratified by a referendum vote of members of the miners' organization. The new contract beginning April 1, 1916, was for two years and provided for an increase of three cents per ton in mining coal on a mine run basis and an increase of 5 per cent for dead work, yardage, and day labor. And on April 22nd, the president and executive board of district 5, United Mine Workers of America ordered out 2400 miners of Pittsburgh because they had not received the 5 per cent increase for day labor, dead work, and yardage provided for in the New York agreement. But later 40,000 miners of Pittsburgh, rejecting the New York scale, drew up and submitted to the Pittsburgh coal operators' association a new scale. This provided for the same advance in mine work as the Eastern agreement—5.39 cents a ton—with 5 per cent on all day work, but "yardage and dead work and all other conditions to remain the same as in the 1914 contract." There were many other strikes of a minor nature among the coal fields during the spring and early summer.

**EAST YOUNGSTOWN.** The first week in January began a strike by laborers in the plant of the Republic Iron and Steel Company at East

Youngstown, Ohio, for an increase of wages; it spread to the plants of the Youngstown Sheet and Tube Company, the Youngstown Iron and Steel Company, and the Brier Hills Company. On January 7th a battle between strike sympathizers and armed guards at the plant of the tube company was followed by a riot in which 3 men were killed, 19 people wounded, and 15 buildings burned. State troops were then called out to restore order. A week later strikes were called off in the plants of the Republic Iron and Steel Company, and the Youngstown Sheet and Tube Company, the men having agreed to accept a 10 per cent wage increase offered by the company in lieu of 25 cents an hour which they had originally asked. After investigating the riot of January 7th, the Mahoning County grand jury on March 8th returned indictments against Elbert H. Gary, chairman of the United States Steel Corporation, and six steel companies. The charge of the indictment was a conspiracy of these concerns to fix the wages of labor and price of iron and steel products in Mahoning County in violation of the Valentine anti-trust law of Ohio.

**STANDARD OIL STRIKE, BAYONNE, N. J.** On October 9th, a strike of employees of the Standard Oil Company for an increase in wages began in Bayonne, N. J. Deciding to shut off the whole of Constable Hook in order to cause idleness or strikes in the plants located there, the strikers established a guard line across the Hook and for three days held possession of the streets. Battles with the police and riots ensued for a week, resulting in the death of three persons and the injury of 37. Finally the police, reinforced by 100 special deputies and 30 firemen, gained control of the situation by driving the strikers into their homes with clubs and revolvers. The managers then agreed to receive all strikers back at work with the exception of those in the shops where the trouble originated, but as the demand for increased pay was refused, the strikers voted on October 17th to remain out. But John A. Moffit and James A. Smyth, conciliation commissioner of the Department of Labor, induced the men to abandon the strike since the Standard Oil Company would not admit mediation until the strike was over. On October 19th, the English-speaking workmen returned to their jobs and were followed on October 20th by most of the others.

**NEW YORK STREET CAR STRIKE.** Because the companies refused to grant motormen and conductors a third raise in wages in six months or to agree to arbitration according to promise, a strike was called on July 22nd on trolley lines in Yonkers, New Rochelle, and Mount Vernon. Gradually the strike spread to New York City. On August 5th not a single surface car was running on many lines in Manhattan. The Public Service Commission and the mayor after several conferences between the companies and union men succeeded in obtaining a tentative agreement between the companies and the men on August 6th by which the strike was ended. In this agreement, although recognition of the union was technically withheld, the right of men to organize and to treat with the company through committees was admitted while arbitration of working conditions and wages was promised. On August 14th, the heads of systems in Manhattan, The Bronx, Queens, and Richmond



received requests for higher wages and better working conditions. These were formulated by committees of employees of various companies and officials of the Amalgamated Association of Street and Electric Railway Employees. A break seemed imminent; but on August 21st, after the company had consented to reinstate all employees in the strike and the union had agreed not to protest against a brotherhood of non-union employees, the dispute was temporarily settled again by Mayor Mitchel.

But negotiations were very soon in an unsatisfactory state once more. On September 1st, at a mass meeting, employees of the Interborough Rapid Transit Company and the New York Railways Company accused the officers of the companies of having violated the agreement and threatened a new tie-up on all transportation lines. There was a final disagreement between officials and employees, and on September 6th the employees of the surface and subway systems voted a general strike; 3000 men on other car lines declared a sympathetic walkout; 5000 policemen were called out for strike duty. On September 7th the Public Service Commission began an investigation of the cause of the strike. The next day reinstatement was offered the men, but only 90 accepted. Then the Central Federated Labor Union appointed a committee with power to call a strike in all the industries of the city, and the men of the Second and Third Avenue lines voted for a sympathetic strike. This movement was seconded by a labor conference and the recommendation sent to each unit of the central union. On September 12th the Interborough refused the commission's recommendation of further conferences with the union and the arbitration of individual contracts. In its statement the commission accused the Interborough Company of breaking a verbal agreement with employees, while it accused the men of breaking their written agreement of August 7th. The union then resolved to call a general strike for September 27th, and the Conference Committee of Central Labor bodies voted unanimously for it. But as many important unions refused to join the carmen, the general strike collapsed. The strike, however, continued, to the increasing disadvantage of the Amalgamated Association. On October 30th, John A. Moffitt and James A. Smyth, Federal conciliators, attempted to bring about a conciliation.

**PRUDENTIAL INSURANCE COMPANY EMPLOYEES.** Because some union employees of the Prudential Insurance Company were dismissed, 600 of the company's agents walked out in a body July 24th; on July 25th the number of strikers was increased to 3000 by walkouts of agents in Philadelphia, Newark, Jersey City, Hoboken, and Bayonne. The strikers insisted that the cause of the trouble was that the company objected to the formation of a union and so discharged the leaders, while the company insisted that the men were discharged for disloyalty. Rowland B. Mahany was appointed by the Department of Labor as conciliator to adjust differences.

**JEWELRY WORKERS.** On February 9th a general strike of jewelry workers in New York City went into effect; diamond setters in Fifth Avenue shops, platinum workers, engravers, lapidaries, polishers, and other craftsmen of the trade to the number of 3000 in 200 shops being

included. This was the first strike in the jewelry trade for 13 years and was called partly because the nearness of the Easter season and its demands on the business promised an early yielding of the employers. But a settlement was not reached until May 1st, when the strikers' demands for an eight-hour day, time and a half for overtime, and the abolition of the home-work system were granted.

**WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY.** On April 21st, a walkout at the Westinghouse Electric and Manufacturing Company of East Pittsburgh was the beginning of a series of strikes in Allegheny County, Pa. By the following day 36 strikes involving 50,000 men were reported. The strikers in the Westinghouse plant demanded an eight-hour day, while those of the munition plants were asking an increase of wage. Intimidation of workers in other near by industrial plants and rioting followed, and State troops were called out. Difficulties were adjusted by conciliators from the United States Department of Labor.

**NORWAY.** On June 7th a general strike was begun as a protest against a bill for compulsory arbitration in labor disputes. This bill was introduced into Parliament as a result of sympathetic strikes which were being carried on in retaliation for the lockout declared by the Norwegian Employers' Association in many trades. However, after the passage of the bill, the strike was called off, the men returning to work on June 15th.

**GREAT BRITAIN.** For the first nine months of 1916 there was a total of 414 strikes, while the total for the same time during 1915 was 531. Of the 414 strikes in 1916, 61 were in the building trades, 47 in coal mining, 8 in other mining and quarrying, 46 in engineering, 15 in shipbuilding, 19 in other metals, 48 in textiles, 25 in clothing, 44 in transport, and 101 in other trades. The total number of work people involved in these disputes was 187,388, as against 407,964 for the same length of time in 1915. In 1916, the greatest number striking in any one trade was 54,970 in the textiles, while the smallest was 1073 in quarrying and other mining; whereas in 1915, the greatest number was 280,256 in coal mining, with the smallest, 149, again in quarrying and other mining. The aggregate of working days lost in all disputes was 2,119,200 for 1916, against 2,613,100 for 1915.

**SPAIN.** A strike begun on the Northern Railroad in Spain spread to other railroads and also to other industries in the great industrial centres. The primary cause of the strike was the refusal of the Northern Railroad Company to raise wages as demanded by workers because of the increased cost of food. A general strike being called for July 17th, martial law was declared in the province and city of Madrid. But after conferences between the prime minister and the representatives of strikers it was agreed to submit the differences to a commission and to suspend the general strike. The men returned to work on the 18th. However, as the railroad company did not reply to the government's proposal to arbitrate, the question was eventually submitted to the Institute of Social Reforms, whose decision the government agreed to put into immediate operation.

**STRINDBERG, AUGUST.** See GERMAN LITERATURE, *Miscellaneous*.

**STRONG, JOSIAH.** An American clergyman and leader in social service, died in New York City April 28, 1916. He was born in Naperville, Ill., in 1847, and after graduating from Western Reserve College in 1869, studied for two years at Lane Theological Seminary. He occupied several Congregational pastorates, for three years was chaplain at Western Reserve, and also held denominational office. In 1886 he became general secretary of the Evangelical Alliance for the United States, giving up this work in 1898 to organize and become president of the League for Social Service. When this latter body was reorganized in 1902 as the American Institute for Social Service, Dr. Strong remained its head. He devoted himself especially to a systematic and thorough campaign to reduce mortality by accident. His watch-word, "safety first," came into general use not only in the United States, but abroad. Dr. Strong was called to England to aid the Earl of Meath in establishing the British Institute for Social Service, and to South America in a similar connection. In 1911 he was president of the Social Centre Association of America. His books reached a large circulation and some of them were translated. Among them were: *Our Country* (1886); *The New Era* (1893); *Expansion* (1900); *The Challenge of the City* (1907); *Our World* (1913); *New World-Religion* (1915).

**STUART, RUTH McENERY.** See LITERATURE, ENGLISH AND AMERICAN, *Poetry*, American.

**STUDENT CAMPS.** See UNITED STATES, *Army*.

**STURGKE, KARL, COUNT.** An Austrian statesman, assassinated in Vienna, Oct. 21, 1916, by Ludwig Adler, a Socialist editor. He was born in 1859, at Graz, and was educated at the university of that city. In 1881 he entered the public service. In 1891 he was elected a deputy to the Reichsrat, and three years afterward was made a director in the ministry of public works. He went out of office with the retirement of the Windisch-Graetz cabinet, but in 1909 reentered political life as minister of public works. On Nov. 3, 1911, he became Austrian Premier and reorganized the cabinet to meet new conditions resulting from the European war. The motive which was reported to have actuated Adler, the assassin, was the prime minister's refusal to convene the Austrian Parliament. Adler was also said to have been of unbalanced mind.

**STURMER, BORIS.** A Russian statesman, became premier Feb. 1, 1916, succeeding Goremykin. His ministry fell in November, 1916, because of its reactionary tendency and prejudice on account of Stürmer's German origin. Stürmer was succeeded by Alexander Trepoff. See RUSSIA, *History*.

**STYRIA.** A crownland of Austria. The area is 8658 square miles; population in 1910, 1,444,157.

**SUBMARINES.** Like those of other types of naval vessels the dimensions of submarines were steadily increasing in 1916. In all navies, experience had shown the vast improvement in efficiency effected by enlarging the tonnage to 800 or more. In craft of that size, reasonable habitability and good sea-keeping qualities are possible. Smaller boats were being relegated to coast defense and operations of limited range from a fixed base. For independent cruising and

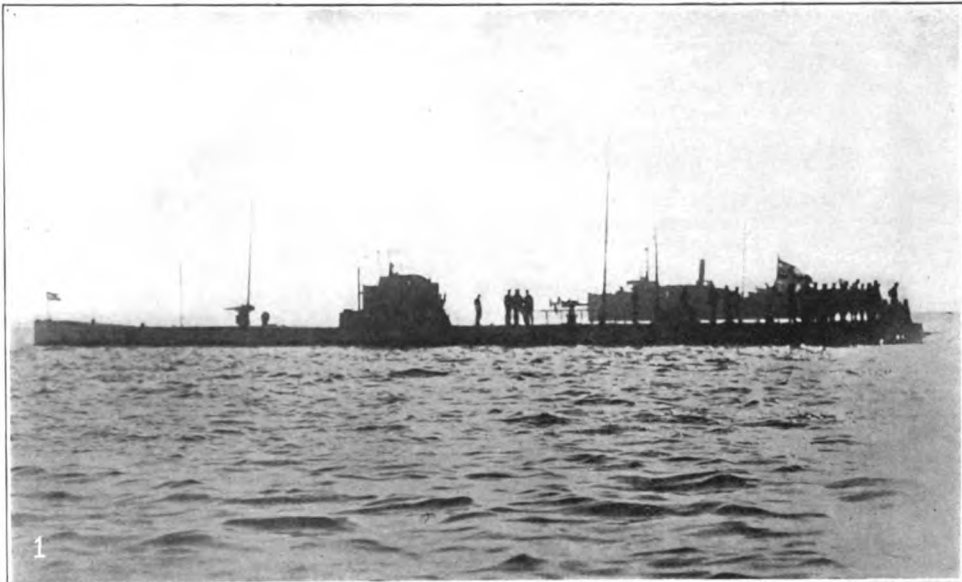
accompanying the scouts and battle fleet, submarines of 1500 to 2500 tons were under construction, because boats of less size cannot be given adequate sea-keeping qualities at fleet speed. Some of the German boats completed in 1916 were said to have the following characteristics: displacement (submerged), 2400 tons; length over all, 279 feet; beam, 26.25 feet; depth (excluding conning tower), 19.7 feet; surface horse power, 7000; surface speed, 22 knots; submerged speed, 14 knots; cruising radius, 6500 miles; supplies carried for six to eight weeks; 8 to 10 torpedo tubes for torpedoes of 21.65 inches in diameter; 4 to 8 guns, some anti-air-craft; covered bridge and conning tower; 2 collapsible boats; 18 tons of lead ballast; height of conning tower, 13 to 16 feet; complement, 3 or 4 officers, 2 or 3 machinists, 1 medical officer, 40 to 50 petty officers and men. The hull was double, the inner and outer skins strongly bound together.

The British submarines of the *F* class, which were not all completed, were of about 1200 tons submerged displacement, had Diesel engines of 5000 horse power for surface running and electric motors of 2000 horse power for submerged propulsion. The speed was said to be about 20 knots. The new boats of the *G* class (none completed so far as known at the end of 1916) were of 1500 tons submerged displacement, 6500 horse power on the surface, and 2400 horse power submerged. The designed speed was said to be 24 knots. British boats of the *H* class were in service but it was thought that they were simply improved designs of the *E* type.

The new fleet submarines building for the United States navy were reported to be of 1500 to 1800 tons displacement and the designed speed was from 20 to 25 knots. Details were being kept secret by the Navy Department.

The French were said to be building a number of submarines of large size as well as others of about 500 tons. The recently completed boats of the *Laplace* type (1070 tons) were steam driven and did not give satisfaction. The new boats, therefore, would probably have Diesel engines. It was reported that Russia had ordered 100 transportable submarines and 50 larger boats from the Submarine Boat Corporation. The transportable boats were 45 feet long and suitable for carriage by rail or on ship-board.

According to German newspapers there were building in Germany in 1916 two or more submergible cruisers of large size. The *Neue Zuercher Post* stated that the details of these boats were as follows: displacement (submerged), 5000 tons; length, 413.4 feet; speed on the surface, 28 knots; speed, submerged, 16 knots; radius of action, 18,000 to 20,000 miles; 30 torpedo tubes; 90 torpedoes; 6 to 8 guns of light and medium calibre in an armored turret which could be raised well above the hull or lowered into it; and 125 to 150 contact mines. All this might be correct; such vessels might be building; but the publication was so open, so much at variance with the ordinary German methods in regard to new weapons of war, that the statements were not looked upon without suspicion. Moreover, the necessary weights were so large as to lead to the conclusion that at least the speeds and cruising radius were too high. The weight of machinery for 28 knots on the surface and 16 knots when



Photos Copyright by International Film Service, Inc.

1. "U-53" off Newport, Rhode Island, U. S. A.
2. "Deutschland" off New London, Conn., U. S. A. The first submarine to make a commercial trans-atlantic trip.

### GERMAN SUBMARINES OF 1916



submerged could not be less than 850 tons if ordinary storage batteries were used for submerged propulsion; and the fuel supply for 18,000 miles at 10 knots for a vessel of 3000 tons (assumed surface cruising displacement) would be over 600 tons. The other necessary weights (including armored conning tower and turret, turret-elevating apparatus, guns and mounts, ammunition, torpedo tubes, torpedoes, and the ordinary equipments and fittings of a submarine) could not be less than 500 tons. The available weight for the hull would then be less than 1050 tons, which is impossible for a double-hulled vessel of the dimensions given. If the cruising displacement is more than 3000 tons the weights of all kinds are much increased—especially those of the machinery and fuel.

At the outbreak of the war all nations were experiencing difficulty with the speed question. Diesel engines of adequate power and satisfactory performance in large submarines had not been produced. The limit of power per cylinder had not materially changed, but engines of many cylinders were built in a manner to give satisfaction. In the new German boats of 2400 tons there were said to be four engines of eight cylinders each with a total horse power of about 7200. The best steam machinery with geared turbines gives a higher efficiency per pound, but it has apparently ineradicable defects that unfit it for submarine propulsion. Another obstacle to higher speed in submarines has been the great weight absorbed in the storage battery equipment for power when submerged.

There have been many attempts to do away with the double set of machinery required by existing arrangements, but the first to give much promise of success is the Neff system under trial in 1916 in the United States navy. In this, Diesel engines alone are used and, when submerged, the products of combustion are carried outboard and discharged without contaminating the air in the boat. A small boat was built and tried and one of 250 tons ordered, its acceptance depending on satisfactory performance. If the Neff system was a success it would permit great improvement in submarine navigation.

The periscope is the subject of many experiments looking to its improvement. According to a Dutch report that came via England, some new German boats were built without periscopes and yet, by an arrangement of lenses in the sides of the conning tower, the operator was able to see without any part of the boat projecting above water. The description of the arrangement was vague and its existence doubtful. The reports might have been formulated to give unpleasant reading and disturbing thoughts to Germany's enemies. The greatest modern improvement in periscopes up to 1916 was effected by Professor Parodi and patented somewhat more than two years previous. It was possible that a new form of this instrument might have been the foundation of the Dutch report. Professor Parodi's invention consisted of a circular glass ring of prismatic section at the top of the periscope tube, the external surface of the ring being toroidal. By means of suitable lenses the rays, totally reflected in the prismatic ring, were carried down the periscope tube, where, by means of another ring, they were thrown on a circular mirror of large diameter surrounding the foot of the peri-

scope tube. An observer in the centre of this mirror was thus able to see the horizon as it appeared to a person on deck. For convenience in determining directions, a transparent compass card throws its markings on the screen below the reflected horizon.

For mine-planting, the Germans are building submarines of special type. One of these, the *UC-5*, was captured by the British. It carried 16 mines in inclined tubes, loaded from the deck and open to the sea at the lower end. Two mines were in each tube, one above the other, and were separately let go by means of trippers in the conning tower. Mine-planting on the enemy's coast was greatly facilitated by the use of such craft, for their operations could not be observed.

The British and French orders for merchantmen and others to ram submarines if possible were said to have brought out a new invention by the Germans. Dummy periscopes were placed on mines with the idea of inviting the enemy to effect his own destruction. See **BATTLESHIPS; NAVAL PROGRESS.**

**SUBWAYS.** See **RAPID TRANSIT.**

**SUDAN, ANGLO-EGYPTIAN.** A country in Africa, under the joint administration of the British and Egyptian governments. Lying south of Egypt, it extends westward from the Red Sea, Eritrea, and Abyssinia to Wadai and the Belgian Congo. Estimated area, 984,520 square miles; estimated population in 1914, 3,380,531. Khartum, with (1916) 23,083 inhabitants, is the capital. Opposite the capital, on the Blue Nile, is Khartum North, with (1915) 15,973 inhabitants. Omdurman, on the White Nile, the former Mahdist capital, has 59,429. An increasing number of West African tribes are settling in the Sudan and as they are hard-working and law-abiding their advent is regarded with favor. Vernacular and industrial schools have increased in number, but are still insufficient. The natives are being educated in modern methods and show great aptitude. Under cultivation in 1914 were 2,096,835 feddans, of which 116,010 were artificially irrigated, and 1,980,825 irrigated by the river at flood and by rain. The total imports were valued in 1915 at £1,679,805; exports, £1,577,991. These figures include specie. Dura (African millet) was exported in 1915 to the value of £274,199; gums, £313,081; cotton, £236,793; ivory, £48,132. The revenue for 1915 was estimated at £1,490,000; expenditure, £1,470,000. There are about 1500 miles of railway in operation. South of Khartum communication is established by boats on the Blue Nile, the White Nile, Sobat, and Bahr-el-Ghazal; inland, mainly by camels and donkeys.

**SUDERMANN, HERMANN.** See **GERMAN LITERATURE, Drama and Miscellaneous.**

**SUFFRAGE.** See **ELECTORAL REFORM; WOMAN SUFFRAGE.**

**SUGAR.** There was an increase in the world production of sugar in 1916, estimated at about 953,000 tons over 1915, but the amount was not equal to that before the outbreak of the European war. Usually high prices maintained. The total output, as estimated by Willett and Gray in December, was 17,545,260 tons. Of this, 11,410,260 tons were cane sugar and the balance beet sugar. The European production of beet sugar was 5,275,000 tons, that of the United States 846,000 tons, and of Canada 14,000 tons.

In continental United States the cane sugar production was double that of 1915—253,000 tons, and there were increases in the crop of Porto Rico, bringing it up to 450,000 tons, and in Hawaii to 675,000 tons. The Cuban crop was the largest on record—3,400,000 tons, as compared with 3,007,915 in 1915 and 2,592,667 in 1914. The production in the principal other countries, as reported by Willett and Gray, was as follows: British West Indies, 175,000 tons; French West Indies, 80,000; Danish West Indies, 12,000; Dominican Republic, 150,000; Mexico, 50,000; Central America, 25,000; Demerara, 120,000; Peru, 200,000; Argentina, 175,000; Brazil, 225,000; Surinam and Venezuela, 30,000; British India, 2,400,000; Java, 1,595,260; Formosa and Japan, 430,000; Philippine Islands, 220,000; Australia, 200,000; Fiji Islands, 110,000; Egypt, 100,000; Mauritius, 220,000; other African countries, 210,000; and Spain, 6000.

The provision in the Underwood Tariff Law by which sugar was eventually to go on the free list, was rescinded by Congress during the year by a very large majority vote.

The sugar-beet curl, an affection of the leaf attributed primarily to the sting of an insect, has become a serious menace to the industry in California and some other Western States. In 1915, 50,000 acres of beets belonging to the Spreckles' interests were so badly affected that no attempt was made to harvest them. Early planting helps to avoid the trouble, as the beets will grow at a lower temperature than the insect.

The flooding of the German market with beet sugar the first year of the war was followed in 1915 by a reduction of over 30 per cent in the area and a large decrease in the production per acre. The increased sugar consumption by man and animal led to the surplus being replaced by a scarcity of sugar, and to remedy this an order was issued early in 1916 increasing the price of raw sugar, which was expected to have the effect of stimulating beet growing.

Switzerland has experienced trouble in securing sugar, as very little is grown and imports are difficult. In February, all stocks of sugar were taken over by the government, which reserved the right of importation. Attempts have been made in Great Britain to establish the sugar beet industry, in view of the present state of the sugar supply. A society of Serbian engineers has organized trial sowings of sugar beets in Serbia, to ascertain the possibility of developing a sugar industry in that country. It is planned to continue the experiments for three years.

Quite an industry is being built up in Utah in the growing of commercial sugar beet seed. In 1915 the trials of one concern on 80 acres gave good profits. A company has been organized which will grow 5000 acres of beets for seed and will supply, it is thought, all the seed needed by one of the large organizations. Others are entering into seed production.

**SUGAR BEETS.** See SUGAR.

**SULPHUR.** The production of sulphur in the United States in 1915 was derived from Louisiana, Texas, Nevada, and Wyoming. In the two last States only small quantities were produced. Over 95 per cent of the whole came from the Union Sulphur Company in Louisiana and the Freeport Sulphur Company in Texas. As reports from these companies are confi-

dential it is not possible to give the output in figures. They will be found in the table of mineral productions of the United States. The stocks of sulphur on hand at the close of 1915 were the largest in the history of the industry. Imports of sulphur in 1915 amounted to 25,910 long tons, valued at \$472,910. There were exported 80,221 long tons, valued at \$1,579,751.

**SUN.** See ASTRONOMY.

**SUNDAY-SCHOOL UNION, AMERICAN.** A voluntary association of Christians of different denominations, founded for the purpose of teaching, especially to the young, the fundamental truths of Christianity. It had its origin in the First Day Society, founded in Philadelphia in 1791, but its present name was assumed in 1824. Its propagandist and executive work includes the circulation of Bibles, New Testaments, and other religious literature, and the founding of Sunday schools. In 1916 it published 10 periodicals and over 1000 books on religious subjects and Sunday schools. Its Sunday school missionaries established, between 1824 and 1916, an average of four new Sunday schools per day. It expends about \$250,000 annually in its organizing and missionary activities. Its officers are: Martin L. Finckel, president; Clarkson Clothier, and Dr. James F. Stone, vice-presidents; William H. Herst, recording secretary; John E. Stevenson, treasurer. The hundredth anniversary will be celebrated in May, 1917. The chief offices are at Philadelphia, Pa.

**SURETY INSURANCE.** See INSURANCE.

**SURGERY. WAR WOUNDS.** The treatment of wounds in the European war is well summed up in the report of Dr. Proust, who is a member of the *Faculté de médecine de Paris* and a hospital surgeon. He has laid before the *Société de chirurgie de Paris* an interesting report based on 18 months of work in ambulances at the front. He first takes up the question of projectiles themselves. In the earliest part of the war most of the wounds were bullet wounds, with only slight infection of the tract. After these came shrapnel and shell fragment wounds. Later the trench warfare produced bullet wounds inflicted at close range and showing explosive effects. Still later there occurred more serious anatomic destruction caused by the frequent use of torpedoes, hand grenades, and high explosives. With regard to infection, Proust remarks that the gravity of the wounds in the early part of the war was more particularly due to defects in the organization of the medical service. Later it was attributed to the nature of the projectiles, to the multiplicity of wounds in a single patient, and to winter conditions in the trenches. From May 5, 1915, to Feb. 5, 1916, 10 months, surgical ambulance No. 1, which was under Proust's direction, cared for 1800 wounded. All the wounds were serious. Of the 1800 wounded, 419 died, a mortality of 23 per cent. This high mortality is explained by the fact that the wounds are always infected. Infection may come from the projectiles or from fragments of clothes. The latter, being impregnated with filthy mud, are particularly dangerous. The tissues are torn and contused. The muscles which are injured are liable to gangrene, and this may, in part, be explained by the lowering of vitality in them produced by fatigue and exhaustion. To these conditions should be added vascular lesions, very often of the veins, due probably to the explosive action of projectiles. These are the principal

reasons for the gravity of the wounds, and from them indications for treatment must be drawn. An irregular bullet track must be transformed into a clean operation wound by free exploration. Proust drew special attention to certain points. In view of the frequency of tears of the venous trunks, he recommends ligature of the vessel outside the primitive lesion above and below and the removal of the injured section. The same is true of arterial lesions. The most serious factor is the injury of bone. Free fragments may be removed, but others must be treated cautiously. As to joint wounds, Proust advises that every articulation that has been penetrated by a projectile other than a bullet must be freely opened. Drainage should be assured even if it is necessary to perform a resection, such as that of the patella or astragalus. In nerve injuries, operative indications are exceptional. Immediate suture has been done twice in Proust's ambulance. For dressings he has recently employed almost exclusively Dakin's solution (q.v.). For fresh superficial wounds or for such wounds as result from circular amputation, herpetic salt solution, 14 per cent, is the ideal topical application. It opposes putrefaction of the tissues, but its use should not be too prolonged and it should soon be replaced by solutions of magnesium chlorid, which seem to have a stimulating effect on tissue regeneration. In the presence of badly infected lacerated wounds, refractory in spite of free opening, the best results were derived from Carrel's method, that is to say, discontinuous irrigation with fresh Dakin's solution. If the infection is characterized by a reddish color of the tissues and bronzed infiltration, Proust substitutes ether for Dakin's solution. Thanks to this careful selection of topical applications, local accidents, such as diphtheria of the wounds, excessive supuration, etc., have become a thing of the past. Unfortunately there exists a class of infections against which the surgeon is helpless. These are the massive primitive infections. In some wounded soldiers there is observed, a few hours after the injury, a high temperature, a pulse scarcely perceptible, and hippocratic facies, contrasting strongly with the appearance of general well-being or even of excitement often seen in wounded soldiers. Left to themselves such patients die in from 24 to 36 hours. The wounds have often a gangrenous smell; the freest opening is useless. Amputation alone can save life, and then only if it is rapidly performed so as to avoid shock.

**SURVEYS, EDUCATIONAL.** See EDUCATION IN THE UNITED STATES; UNIVERSITIES AND COLLEGES.

**SUTHERLAND, HOWARD.** Elected Republican United States Senator from West Virginia, Nov. 7, 1916.

**SUTBO, ROSE and OTTILE.** See MUSIC, Artists, Instrumentalists.

**SUZZALLO, HENRY.** See WASHINGTON, UNIVERSITY OF.

**SWAMP FEVER.** See VETERINARY MEDICINE.

**SWAMP LANDS.** See DRAINAGE.

**SWANSON, CLAUDE AUGUSTUS.** Re-elected Democratic United States Senator from Virginia Nov. 7, 1916.

**SWARTHMORE COLLEGE.** A non-sectarian co-educational institution at Swarthmore, Pa. It was founded in 1864 by the Society of

Friends (Quakers). In all departments in the fall of 1916 there were 448 students. The faculty numbered 47. Among a number of new appointments during the year the most important was that of Dr. Ethel Hampson Brewster as assistant professor of Latin. Before the close of 1916 \$400,000 had been subscribed toward a Jubilee Fund, in anticipation of the Jubilee Year of the college in 1919. Swarthmore has in productive funds about \$1,500,000. The library contains 32,500 volumes. President, Joseph Swain.

**SWAZILAND.** A British protectorate in southern Africa, covering 6536 square miles and having a population of 99,959. Capital, Mbabane.

**SWEDEN.** A constitutional European monarchy hereditary in the male line of the house of Bernadotte. It occupies the eastern part of the Scandinavian Peninsula. Capital, Stockholm.

**AREA AND POPULATION.** The land area is 158,692 square miles; the combined area of land and water, 173,008 square miles. The total population was estimated Jan. 1, 1915, at 5,679,607. Total population 1910, 5,522,403; 1900, 5,136,441; 1880, 4,565,668; 1840, 3,138,887. Marriages 1914 numbered 32,845, living births 120,451, deaths 78,189—a surplus of births over deaths of 51,262. Total emigration in 1914, 12,960, of which 9589 to the United States. A table of principal towns, with population at the beginning of 1915, follows:

Stockholm	386,270	Karlstad	18,673
Göteborg	181,500	Halmstad	18,527
Malmö	108,004	Sundsvall	16,668
Norrköping	45,984	Lundakrona	16,555
Gävle	35,937	Kalmar	15,917
Hälsingborg	85,235	Uddevalla	18,261
Orebro	33,780	Södertälje	12,808
Eskilstuna	29,167	Falun	12,068
Karlskrona	28,127	Ystad	11,998
Jönköping	28,069	Kristianstad	11,853
Uppsala	27,773	Söderhamn	11,591
Linköping	24,966	Västervik	11,007
Västerås	23,227	Nyköping	10,781
Borås	23,158	Trälleborg	10,788
Lund	22,578	Visby	10,061

**EDUCATION.** Elementary schools are maintained by local taxation with state aid. Elementary instruction is free and obligatory. Illiteracy is not common. The secondary and special school systems are well developed. There are universities at Lund and Uppsala, as well as private faculties. The Lutheran is the national creed; all others are tolerated, Mormonism excepted.

**PRODUCTION.** The northern regions are under forest; in the central districts are the majority of the mines; and the southern part is devoted to agriculture, in which about 49 per cent of the people are engaged. In the table below are given area devoted to principal crops, and production for three years:

Crops	Acres		
	1918	1913	1914
Wheat	259,597	287,583	269,255
Barley	436,202	441,488	435,708
Oats	1,951,300	1,973,678	1,958,908
Rye	788,000	910,893	980,868
Mixed grain	712,243	422,741	414,787
Beans	9,386	5,187	6,274
Peas	43,719	55,822	37,106
Potatoes	375,440	383,270	375,736

Crops	Quarters		
	1918	1913	1914
Wheat	948,716	1,138,328	1,016,881
Barley	1,654,744	1,923,591	1,402,019

Crops	Quarters		
	1912	1913	1914
Oats	9,194,281	10,122,647	5,429,825
Rye	2,825,816	2,727,038	3,802,647
Mixed grain	1,967,797	2,286,213	1,210,172
Beans	21,072	19,216	8,869
Peas	127,222	155,375	88,841
Potatoes *	68,732,900	85,465,875	71,678,475

\* Bushels.

Forests cover half of the total area, and supply timber, pitch, tar, and fuel. Pine, birch, and fir are most abundant. The mineral wealth is great. Coal is mined; an excellent grade of iron (Dannemora) is converted into the finest steel made; gold and silver are produced in small quantities, and copper, lead, zinc, nickel, cobalt, alum, and sulphur are mined. Output of copper ore in 1914, 8839 tons; silver and lead ore, 3100; zinc, 42,279; manganese, 3643; sulphur pyrites, 33,313; coal, 366,639; iron, 6,588,300. Iron ore exported (1914), 4,787,314 tons; pig iron, 175,400. Total pig iron produced, 639,718 tons; bar iron, 441,060. There were (1913) 1053 saw and planing mills (value of output 216,130,514 kronor), 411 joineries and furniture factories (31,155,281 kr.), 119 wood-pulp mills (104,592,443 kr.), 68 paper and pasteboard mills (68,982,890 kr.), 619 flour mills (117,979,743 kr.), 307 iron and steel works (51,232,524 kr.), 564 machinery factories (185,988,800 kr.), 20 sugar mills (33,685,372 kr.), and 10 refineries (73,256,244 kr.), etc. Live stock (1913): 596,136 horses, 2,720,748 cattle, 988,163 sheep, 967,687 swine.

COMMERCE. In thousands of kronor are shown below imports and exports, including precious metals:

	1907	1909	1911	1913	1914
Imports	682,105	616,806	696,617	846,538	726,908
Exports	524,668	472,980	663,576	817,847	772,855

The principal classes of imports and exports in the 1914 trade, with values in kronor, are given as follows:

	Imports	Exports
Textile mfrs.	53,923,890	9,864,326
Corn and flour	51,611,601	6,446,744
Colonial wares	50,780,416	1,697,978
Raw textile material and yarn	67,584,283	10,612,476
Minerals	125,999,727	71,245,208
Metal goods, machinery, etc.	89,717,849	92,210,652
Live animals and animal food	24,249,573	115,988,521
Hair, hides, etc.	38,305,721	24,816,020
Metals, raw and partly wrought	47,711,121	71,430,185
Timber, wrought and unwrought	12,097,449	174,968,260
Wood pulp, paper and mfrs.	4,786,682	137,623,511
Various	160,139,561	55,451,192
Total	726,907,873	772,855,078

The important countries of origin and destination in the 1913 and 1914 trade are shown below, values in thousands of kronor:

	Imports		Exports	
	1913	1914	1913	1914
Germany	289,902	238,550	179,078	174,840
United Kingdom	206,801	183,808	235,535	258,319
United States	76,583	78,076	34,408	41,208
Russia	50,520	23,783	46,978	48,457
Denmark	53,680	51,647	70,651	72,850
France	35,284	28,880	66,260	32,688
Norway	25,928	29,036	54,034	48,882
Netherlands	20,884	19,303	19,225	18,700
Belgium	13,398	8,936	18,598	8,243
Spain	3,966	3,028	11,219	11,707

Vessels entered in the 1913 trade, 22,519, of 12,705,000 tons; cleared, 22,486, of 12,709,000. Merchant marine, Jan. 1, 1914, 1509 sailing, of 151,867 tons, and 1313 steamers, of 721,339—total, 2822, of 873,206 tons.

COMMUNICATIONS. There were, at the end of 1914, 9094 miles of railway lines, of which 2971 were operated by the state and the remainder by private companies.

FINANCE. The krona is the monetary unit (worth 26.8 cents). Revenue in 1916 from customs, 73,600,000 kr.; excise, 72,500,000; tax on income, invested capital, etc., 40,850,000; personal tax, 850,000; revenue-earning administrations, 55,915,000; from loans, 53,675,000; state bank profits, 8,760,000, etc. Ordinary and, in parenthesis, extraordinary expenditure as follows: 58,789,189 (45,334,511) kronor for army, 24,266,350 (16,204,250) marine, 13,628,638 (13,914,562) interior, 24,193,774 (3,793,426) finance, 33,652,384 (5,208,716) worship and instruction, 8,316,341 (4,608,959) agriculture, 6,791,996 (3,637,740) pensions, 5,423,792 (843,908) justice, 1,838,781 (198,819) foreign affairs, 1,345,000 civil list; total ordinary and extraordinary, 400,682,400 kr.

GOVERNMENT. The constitution on June 6, 1809, as amended June 22, 1866, vests the executive authority in a king, assisted by an executive council. The upper chamber of the legislative body (Riksdag) is composed of 150 members elected for six years by provincial and communal electors; the lower has 230 members elected for three years.

The reigning king, Gustaf V, was born June 16, 1858; he married Sept. 20, 1881, Princess Victoria of Baden, and succeeded his father to the throne Dec. 8, 1907. The heir-apparent is Prince Gustaf Adolf, born Nov. 11, 1882, married June 15, 1906, to Princess Margaret of Great Britain and Ireland; issue, three sons and a daughter.

HISTORY

SWEDEN AND THE BLOCKADE. There was much ill-feeling in Sweden on account of the blockade, and against England particularly for interfering with Swedish mail and commerce. By way of retaliation, Sweden in January held back a large quantity of British mail destined for Russia. The Riksdag opened on January 17th. In a speech from the throne, the King urged the strengthening of Swedish military forces to protect the country against violation of her rights as a neutral. Much comment was occasioned by Premier Hammarckjoeld's public suggestion in his speech of January 24th that Sweden might be drawn into the war. He gave it to be understood that Sweden did not sympathize with certain of the other neutral powers, especially Denmark and Norway, in their policy of favoring the Entente Allies at the expense of the Central Powers. He thought that Norway and Denmark were not taking sufficient safeguards against the economic encroachments of the Entente Allies, and he said that it was possible that Sweden would not remain indefinitely neutral. The discussion in Parliament brought out vigorous opposition to the Entente Powers. Relations were further strained by Russia's fortification of the Aland Islands (see below), but on May 17th the Foreign Minister, Wallenberg, announced that that crisis was passed. At about



the same time the grievances against England were reported to have been adjusted in a friendly manner, and in the latter part of June Sweden agreed to submit to arbitration after the war the question of the legality of her seizure of British mail. The party that agitated against the Entente Powers, and on behalf of a vigorous military policy, were known as "Activists." Under their impulse, the Riksdag passed a military appropriation amounting to 104,000,000 kronor.

**ALAND ISLANDS.** According to the North Sea Baltic Treaty with Russia in 1908 the Aland Islands were not to be fortified or used for any military purpose whatever. On the outbreak of the war in 1914 the question of fortification was raised, since the islands formed a natural barrier between the Baltic and Gulf of Bothnia, and afforded a naval base at the entrance of the Gulf of Finland. On May 17th, the subject was discussed in the Riksdag, and it was announced that the danger of Swedish entry into the war had passed. France and Great Britain procured from Russia assurances that if the islands were fortified it would be only for the present war, and that military works would be removed when the war ended. Better relations between Sweden and Great Britain followed this intervention, and arrangements were made looking to mutual concessions and the extension of trade.

**FURTHER DIFFICULTIES WITH THE ENTENTE POWERS.** The question of neutrality was again raised by Sweden's course on July 22nd, which was described by the Entente Powers as virtually closing the Baltic to their ships, since it reserved to Swedish vessels alone the only course by which non-Swedish vessels could pass from the Sound into the Baltic under shelter from German attack. The Entente governments addressed a remonstrance on that subject to Sweden on August 30th and the latter replied on September 22nd. Her response was regarded as conciliatory, and a further indication of an intention to deal fairly by the Entente Allies was Sweden's adherence, along with Denmark, to the Norwegian policy, announced on October 13th, in respect to violations of neutrality by submarines. On that date the Norwegian government had issued a decree forbidding belligerent submarines to use Norwegian waters as a base of operations for attacks on the enemy, a practice hitherto followed by the Germans.

See **ARBITRATION AND CONCILIATION, INDUSTRIAL.**

**SWEDENBORGIANS.** See **CHURCH OF THE NEW JERUSALEM.**

**SWEDISH LITERATURE.** See **SCANDINAVIAN LITERATURE.**

**SWEET, JOHN EDSON.** An American mechanical engineer and manufacturer, died in Syracuse, N. Y., May 8, 1916. He was born at Pompey, N. Y., in 1832, was educated in district schools, and after experience as a carpenter's apprentice, practiced as an architect and builder in the South till 1861. Then until 1873 he devoted himself to work as an inventor and mechanical draftsman; for six years after this he held the chair of practical mechanics at Cornell University; and from 1880 till his death was president of the Straight Line Engine Company of Syracuse. Mr. Sweet was honored in many ways for his achievements. He was the first president of the Engine Builders' Association of the United States (1899-1901), had been presi-

dent of the American Society of Mechanical Engineers in 1883-84, and held similar office in the Syracuse Metal Trades Association and the John Fritz Medal Association. In 1914 he was awarded the 10th John Fritz medal. In 1906 he published *Things that are Usually Wrong.*

**SWIMMING.** The swimming season of 1916 was noteworthy for the large number of records established. Seventeen new marks were made by men and 11 by women. In long distance swimming all previous records went by the board due to the efforts of Henry Sullivan of Lowell, Mass., who swam 20 consecutive hours; Charles Durborow of Philadelphia, Pa., who covered 36 miles in the Delaware River in 13 hours, 13 minutes; and Miss Anna Kean of Lansdowne, Pa., who swam 26 miles in 11 hours, 8 minutes, 45 seconds.

The sprint honors for the year were won by Perry McGillivray of the Illinois A. C. and Miss Olga Dorfner of Philadelphia, Pa. Herbert Vollmer of Columbia University captured the 200-yard title in the world's record time of 2 minutes 23½ seconds in a 75-foot pool. Miss Dorfner annexed the 50 and 100 yards championships for women in the record times of 30½ seconds and 1 minute 8½ seconds. Ludy Langer of the Los Angeles A. C. proved the best at the middle distances, setting up new world's figures for the 500- and 1000-yard events.

The Illinois A. C. successfully defended its title in water polo and relay racing, defeating the New York A. C. team in both contests.

**SWINE.** See **STOCK RAISING AND MEAT PRODUCTION.**

**SWITZERLAND.** A central European republican confederation composed of 25 cantons and demi-cantons. Berne is the capital.

**AREA AND POPULATION.** In the table below are found the area and the *de jure* population of the 25 divisions; area in square kilometers, population as estimated July 1, 1913:

	Sq. Km.	Pop.
Zurich .....	1,724.76	584,250
Berne .....	6,844.50	660,640
Lucerne .....	1,500.80	172,500
Uri .....	1,076.00	22,780
Schwyz .....	908.26	56,210
Obwalden .....	474.80	17,650
Nidwalden .....	290.50	18,980
Glarus .....	691.20	33,570
Zug .....	289.20	28,940
Fribourg .....	1,674.60	142,690
Solothurn .....	791.51	121,240
Basel-Stadt .....	85.76	142,870
Basel-L'dt .....	427.47	78,550
Schaffhausen .....	294.22	47,270
Appenzell A.-Rh. ....	242.49	58,070
Appenzell I.-Rh. ....	172.88	14,860
St.-Gall .....	2,019.00	315,160
Graubünden .....	7,182.80	119,860
Aargau .....	1,404.10	286,860
Thurgau .....	1,011.60	140,540
Tessin .....	2,800.90	160,680
Vaud .....	3,252.00	827,870
Valais .....	5,224.00	180,750
N'châtel .....	807.80	134,910
Geneva .....	282.35	160,960
<b>Total .....</b>	<b>41,323.99</b>	<b>3,877,210</b>

Total population in 1910 (census), 3,753,293, of whom those speaking German as their native tongue numbered 2,599,194; French, 796,220; Italian, 301,323; Romansh, 39,912; other languages, 28,172. Protestants numbered 2,108,642, and Roman Catholics, 1,590,832. The number of marriages in 1913 was 26,841 (27,346 in 1910), births 92,603 (96,669), deaths 58,273

(59,653), stillbirths (included) 2846 (3155). Emigration in 1914, 3869 (5512 in 1911), of whom 2890 went to the United States, 367 to Argentina, 251 to Canada.

The communal population of Zurich, as estimated in the middle of 1913, was 200,600; Basel, 137,500; Geneva, 135,000; Berne, 90,800; St. Gall, 80,000; Lausanne, 69,400; Lucerne, 41,500; Chaux-de-Fonds, 38,600; Winterthur, 25,800; Neuchâtel, 24,100; Bienne, 24,000; Fribourg, 21,200; Montreux, 19,700; Schaffhausen, 18,600; Vevey, 14,000.

**EDUCATION.** Primary instruction is free and in the Protestant cantons enforced. The cantons and communes are responsible for educational affairs within their limits. There are efficient secondary and private schools, well attended; and seven universities.

**PRODUCTION.** For the bulk of food products consumed, Switzerland is dependent on her imports. Of the 71.6 per cent of the total area classed as productive, 35.8 per cent is under grasses, 29 per cent under forest, 18.7 under orchards, etc., and 16.4 under sown crops. The area under main crops and the yield for two years appear in the table below, with yield per hectare in 1915:

	Hectares		Quintals		Qs. ha.
	1916	1915	1916	1915	
Wheat	50,000	45,950	1,040,000	1,077,000	28.4
Rye	28,900	26,900	508,000	523,000	19.4
Barley	7,100	6,500	134,000	128,000	19.7
Oats	41,800	37,300	979,000	814,000	21.8
Corn	1,500	1,860	38,500	35,000	25.7
Vines*	21,185	21,600	484,000	871,000	40.8
Tobacco	250	250	4,750	4,800	17.2
Potatoes	78,000	64,500	6,000,000	10,800,000	167.4

\* Production in hectolitres.

Cheese, condensed milk, and milk chocolate are important products for export. The timber industry, pisciculture, salt mining, cement manufacture, and distilling are flourishing industries. Great numbers of men and women are engaged in house industries, which include the making of watches and clocks, leather goods (including gloves), pottery, tobacco, snuff, etc. About 60,000 persons are employed in silk and cotton mills. See DAIRYING.

**COMMERCE.** Imports and exports of merchandise and precious metals are given below in francs:

	1911	1913	1914
Imports	1,843,843,263	1,919,816,000	1,461,638,000
Exports	1,288,838,217	1,376,399,000	1,186,871,000

The principal articles of import for consumption and of export of domestic produce are shown in the table below, values for 1914 in thousands of francs:

Imports	1000 fr.	Exports	1000 fr.
Cereals, etc.	188,000	Cottons	213,633
Silk	153,966	Watches	120,813
Coal	109,822	Silk	258,644
Animals	31,946	Machinery	74,974
Cottons	92,196	Cheese, etc.	119,700
Chemicals	38,273	Chemicals	19,088
Precious metals	62,664	Silk mfrs.	258,644
Woolens	52,339	Hides	47,061
Cotton	92,196	Iron mfrs.	28,441
Wine	46,583	Woolens	21,077
Meat	67,491	Animals	11,597
Machinery	84,592	Col. prods.	56,187
Timber	27,775	Clothing	19,987
Iron mfrs.	76,857	Precious metals	11,915
Wool	52,339	Minerals	12,340
Leather	33,258	Timber	7,043

The principal countries of origin and destination, with the value of their trade in 1913 expressed in thousands of francs, are as follows: Germany, 630,870 imports and 305,660 exports; France, 347,985 and 141,250; Italy, 207,025 and 89,153; Austria-Hungary, 108,469 and 78,358; United Kingdom, 112,666 and 236,165; United States, 117,898 and 136,432; Russia, 71,467 and 58,719.

**COMMUNICATIONS.** The electrification of the St. Gothard Railway by the Swiss government was in progress during 1916 and about \$600,000 was being spent on the work out of a total estimated cost of about \$7,500,000. The length of line being electrified is about 68 miles. Two power stations were under construction, one at Amsteg utilizing the water of the river Reuss under a head of 900 feet and the other at Piotta where the head of water is 2642 feet and 39,000 horse power will be developed. A single-phase system similar to that used on the Lötschberg tunnel line was recommended for adoption on the new line.

This was said to be the first step in a project which ultimately involved the operation of all the 2000 miles of Federal owned railways by electricity which will make Swiss transportation independent of imported fuel, for no coal is mined in Switzerland.

With the outbreak of the war and the reduction of tourist and freight traffic the Swiss Federal Railway receipts decreased from \$41,055,153 in 1913 to \$35,199,340 in 1914, the approximate decrease during the last five months of 1914 being 30 per cent. The operating expenses also decreased from \$25,722,654 in 1913 to \$24,958,567 in 1914. As a result the surplus in 1914 available for railway reconstruction and the renewal of railway material, as well as for special funds, was therefore only \$10,240,773, as compared with \$15,332,499 in 1913. On October 1, 1916, a surtax was imposed by the Swiss railways upon passenger, freight, and express traffic. Railway tickets from 50 centimes (\$0.0965) to 95 centimes (\$0.1833) paid 5 centimes (\$0.00965) additional; those of 1 franc (\$0.193) and over paid 10 centimes (\$0.0193). Baggage and express charges paid 10 centimes surtax and freight 1 centime per 100 kilos (220 pounds), with a minimum of 10 centimes.

There were in operation in 1914, 3530 miles of railway. About a third of the railways have been nationalized, but they have not proved a profitable enterprise. The cost of construction to end of 1913, 2,139,946,371 francs. Receipts from traffic during 1913, 228,267,224 francs, of which 110,269,793 francs from passenger traffic.

**FINANCE.** The details of revenue and expenditure in the 1915 budget are seen in the following table:

Revenue	1000 fr.	Expenditure	1000 fr.
Customs, etc.	60,784	Military	36,004
Investments	3,725	Interior	13,830
Military	4,494	Ind. and agr.	12,217
Posts and Rys.	44	Customs, etc.	9,943
Real property	2,791	Debt charge	10,057
Ind. and agr.	1,941	Justice, etc.	1,584
Justice, etc.	616	Administration	1,536
Interior, etc.	6	Political	1,825
Administration	118	Posts and Rys.	12,947
Political	525	Miscellaneous	47
Miscellaneous	1,496		
<b>Total</b>	<b>76,490</b>	<b>Total</b>	<b>99,990</b>

The debt stood, Jan. 1, 1916, at £16,220,800; floating debt, £4,220,000.

On December 14th Edmund Schulthess was elected president to succeed Camille Decoppet.

#### HISTORY

**NEUTRALITY.** The difficulty of maintaining neutrality was frequently illustrated during the year. There were some anti-German demonstrations but they were promptly suppressed. At Lausanne, for example, a flag hoisted in honor of the Kaiser by the German consul was torn down by the mob, who successfully resisted the efforts of the police to protect it. Extraordinary meetings of the Federal Council and of the councils of Lausanne and Vaud were held for the purpose of reparation, and an apology was tendered by the Swiss minister to the Berlin government, by which it was promptly accepted. On January 13th two officers were arrested on the charge of high treason for the transmission of telegraph messages from one group of belligerent powers to the other and for the betrayal of Swiss military secrets to the Central Powers. The case attracted much attention. The trial resulted in their acquittal on this charge, but they were returned to their superior officers for disciplinary judgments. The punishment announced on March 1st consisted merely in detention for 20 days. At the end of April nine persons, including several newspaper correspondents, were accused of espionage, but they were acquitted by the court at Berne on March 6th. On March 31st the Federal Council protested against violations of Swiss neutrality by German aviators.

**THE GOVERNMENT AND THE DEPORTATIONS.** In response to many complaints of Swiss citizens, the government took action on behalf of the French non-combatants who had been deported by the Germans from the invaded territory in the north of France. On September 9th the Federal Council offered its good offices to the German government for the passage of any French people through the country on their way back to their homes, and it also, after having been informed of the deportations in Belgium, instructed its ambassador in Berlin on November 21st, to call the attention of the Imperial Chancellor to the unfavorable impression produced on Swiss public opinion by the wholesale deportations of Belgian workmen into Germany. Nothing came of this overture. Toward the end of the year the government was urged by petitioners from the cantons of Geneva, Vaud, and Neuchâtel to protest against the deportations of the Belgians and the French. The Federal Council reported on the subject to the Federal Assembly saying that despite the signature of Switzerland to the Hague Convention, it was not the duty of the Swiss government to investigate the facts of the case on its own responsibility, and still less was it its duty to render a verdict in the matter. Beyond the steps already taken, the Federal Council did not believe that Switzerland, as a neutral country, ought to go. It therefore recommended the rejection of the petition. The President of Switzerland outlined the position of his government on this point to a member of the press. He said it was to the vital interest of Switzerland that she should remain absolutely neutral toward all belligerents. The economic situation of Switzerland was, he

said, very complicated. The people were obliged to work and carry on trade with both belligerents. This difficulty did not exist in other countries and it might easily give rise to serious misunderstanding.

**COMMERCIAL AGREEMENT WITH GERMANY.** On September 28th Switzerland signed a commercial convention with Germany, by which the latter agreed to deliver a certain quantity of her products each month subject to diminution from the necessities of the war, and Switzerland undertook to stop the exportation to the Entente Powers of arms, munitions, and explosives in the making of which German machinery had been employed or into which German raw materials had entered. On October 14th the Federal Council issued an ordinance giving effect to this clause. There was much complaint on the ground that it would throw a large number of workmen out of employment. A meeting of factory owners was held on October 17th to protest against it, contending that the raw materials for ammunition came from the Entente Powers and that Belgian, not German, coal was used. Friends of the Entente Powers argued in the press that Switzerland ought to reduce her shipments to Germany in the same proportion that Germany reduced hers, and that the Entente ought to stipulate in like manner that no products made in Switzerland should be shipped to Germany if any materials from Entente sources entered into their composition.

**OTHER EVENTS.** On March 15th the National Council, after a debate, voted to leave the Council of State in possession of the extraordinary powers conferred upon it and approved the course it had taken since the outbreak of the war. On May 17th an international Socialist conference was held at Kienthal (see **SOCIALISM**). In June another loan of 100,000,000 francs in 4½ per cent bonds was issued, bringing the total loans, including the cost of mobilizing and guarding the frontier and the loan of \$15,000,000 placed in the United States, to 462,200,000 francs. It was issued at 97. On July 5th it was announced that it had been oversubscribed by more than 50 per cent. At about that date it was estimated that since the beginning of the war the Swiss debt had risen from 28 francs to 150 francs per capita. On September 19th the Federal Council decreed a special war profits tax of 25 per cent on all profits realized since Jan. 1, 1915. The National Assembly on December 14th elected as president of the Confederation Edmund Schulthess, of Aargau, who had been at the head of the national department of public economy. He received 176 out of the 189 votes.

**SYLVA, CARMEN.** See **ELIZABETH, DOWAGER QUEEN OF RUMANIA.**

**SYMONS, ARTHUR** See **LITERATURE, ENGLISH AND AMERICAN, Essays, English.**

**SYNTHETIC CAMPHOR.** See **CHEMISTRY, INDUSTRIAL.**

**SYNTHETIC GEMS.** See **MINERALOGY, Ruby.**

**SYPHILIS.** See **INSANITY; PROSTITUTION.**

**SYRACUSE FESTIVAL.** See **MUSIC, Festivals.**

**SYRACUSE UNIVERSITY.** A non-sectarian co-educational institution at Syracuse, N. Y. It was founded in 1870 under the auspices of the Methodist Episcopal Church. For the academic year 1916-17 there was an esti-

mated enrollment of 4100 students. The faculty numbered 326. During the year Prof. William H. Mace of the department of history became professor emeritus. A gift of \$300,000 was made by Mrs. Russell Sage to erect the Joseph Slocum Building for the College of Agriculture. The productive funds of the institution amount to \$2,052,781. In 1916 the total income of the university was \$733,630. The library contains 105,600 volumes. Chancellor, James Roscoe Day.

**SYRIAN RELIEF.** See RELIEF FOR WAR VICTIMS, section *Serbia, Armenia, and Syria*.

**TAFT, WILLIAM HOWARD.** See UNITED STATES, *passim*.

**TAGGART, THOMAS.** Appointed United States Senator from Indiana, March 20, 1916, to fill the vacancy caused by the death of Sen. Benjamin F. Shively (q.v.). He had long been known as a Democratic leader. On November 7th, James E. Watson, Republican, was elected to succeed Taggart.

**TAIWAN.** See FORMOSA.

**TALBOT MARINE BOILER.** See BOILERS.

**TALES.** See LITERATURE, ENGLISH AND AMERICA, and articles on French, German, Italian, Russian, and Scandinavian Literatures.

**TALL BUILDINGS.** See ARCHITECTURE.

**TANKS.** See MILITARY PROGRESS.

**TARIFF.** Discussion of the tariff figured largely in the political campaign. Both parties held closely to their traditional positions. Republican speakers strongly insisted upon the necessity of increased protection. The industrial depression of 1914 following the enactment of the Underwood-Simmons tariff was pointed to as an indication of the dependence of industrial prosperity upon the protective system. Democratic orators, on the other hand, maintained that the depression following the new law was not peculiar to the United States and that the increase of imports thereunder was confined to goods to which a protective system would in no case apply. They moreover pointed to the great prosperity of the country and the increasing prestige of the United States in international trade, together with the disruption of industry in Europe and the increasing security of American industry. President Wilson specifically declared that, in view of the awful waste of capital and terrible destruction of labor power in Europe and, on the other hand, the unprecedented prosperity of American industry and the unusual opportunity for reaching out to the markets of the world, American business men should feel insulted by any suggestion that their ability to compete in world and domestic markets was dependent on special protection from foreign competitors. Both parties favored the creation of a permanent tariff commission. Moreover, the Democrats, while favoring a tariff primarily for revenue, declared that "tariff rates are necessarily subject to change to meet changing conditions," thus opening the way for modification of rates deemed necessary to protect newly established industries resulting from war conditions. Moreover, the Republicans declared in favor of measures to prevent monopolies and trusts from being able to make "undue exactions" because protected from foreign competition.

On April 10th Secretary of Commerce Redfield transmitted to the Senate an extended statement of the results of the Underwood-Simmons tariff on foreign trade during the fiscal years 1913-14 and 1914-15. This in general showed

that the reduction of rates had not affected American industries adversely, but had in fact stimulated them. In April, also, after several weeks' parleying the clause of the Underwood tariff providing for the free importation of sugar after May 1, 1917, was repealed. The Senate favored the retention of this tax until 1920. The repeal of this proviso retained a source of about \$45,000,000 revenue. In this connection it should be noted that the imports of sugar in the fiscal year 1916 were valued at \$300,000,000, of which one-third came from the American possessions of Porto Rico and Hawaii. Of even greater pertinence is the fact that during 1916 the United States became the greatest exporter of refined sugar in the world.

In the Omnibus Revenue bill passed in September were contained provisions for a special duty of 12 per cent ad valorem on print paper valued at more than five cents per pound. There was also provided a special protective duty on dyestuffs and various chemicals to be in force for five years from date of passage. It was proposed in the House that this latter measure should not go into force until the establishment of peace, but this proposal was rejected. Nevertheless the time limitation was inserted in order to carry out the Democratic doctrine of opposition to a permanent protective system. This same measure established a tariff commission and appropriated \$300,000 for its activities during the fiscal year 1916-17 (see below). Toward the close of the year the increasing deficit in the Federal revenue raised pertinently the question whether increases in tariff rates were not advisable as a means of meeting the increased expenditures for national defense. It was announced that Secretary McAdoo, with the President's approval, was formulating a series of proposed new tariffs for submission to the leaders of Congress. It was suggested that in view of the great volume of importations of rubber and coffee, merely nominal rates on these articles would produce considerable revenue. Restoration of a woolen tariff was also suggested, to apply, not to raw wool, but to woolen products.

**TARIFF COMMISSION.** Following a specific recommendation of President Wilson, a bill for the creation of a tariff commission was introduced in the 64th Congress, first session. On January 25th, in a letter to Representative Claude Kitchin regarding this proposal, President Wilson pointed out that his recommendation represented a change in his own position, and in fact a reversal of the policy of the Democratic party. The tariff board, which had been established in the Taft administration, had been extinguished by the Democrats on the ground of its inexpediency. They opposed particularly the provision that the board should investigate the differences in costs of production at home and abroad. They pointed out that inquiries had shown greater differences between costs of different plants in the United States than between costs in American plants on the average and foreign plants. Hence this later difference was not a proper criterion for rate making. The bill for the creation of a new board gave it power to investigate tariff rates, commercial credits, and unfair competition of foreign industries, including dumping. It was provided that the cost of production division of the Bureau of Foreign and Domestic Commerce and all

records of the previous board should be transferred to the new commission. The commission was given extensive powers in summoning witnesses and otherwise securing information. Nothing, however, was said regarding the investigation of differences in cost of production, nor was the commission instructed to recommend rates to Congress. It was, however, expected to present to Congress from time to time reports of a semi-scientific and non-political nature. This proposal advanced the discussion of tariff problems to a new plane and furnished Democratic partisans with a basis for answering the contention that the cessation of the European war would require a general elevation of tariff duties by the usual congressional methods of log rolling or more or less special favoritism.

**AMERICAN FREE TRADE LEAGUE.** This organization at its annual meeting in July elected Mr. George Haven Putnam as president, to succeed Mr. Harry N. Shepard, who had served the league for 30 years. In a statement issued at that time and signed by the secretary, Kenneth B. Elliman, reference was made to the plans being developed by the various belligerents (see *Abroad* below) in these terms: "These schemes, representing as they do a mediæval, not to say barbaric, policy, may well arouse criticism and alarm on the part of neutral nations." The statement declared that "the efforts of one nation to impose punitive boycotts on another by means of tariff regulations bring no final commercial advantage" and "add to the burdens and distress of the people of both countries." On the contrary, it said, the world's movement before the war was toward closer financial and business relations and efforts to reverse this movement might prove more costly than war itself. The statement laid down as a fundamental principle that it is more profitable, as well as more civilized, to trade with a neighboring state than to crush its independence or undermine its prosperity. It contended "that protection is itself a form of war, that war brings about an extreme of protection, and that freedom of trade constitutes an essential factor towards securing and maintaining the peace of the world."

**ABROAD.** Throughout the year the publicists of England, France, Germany, Russia, and other countries gave earnest attention to the tariff and problems of international trade regulation both during and after the war. It was generally recognized that upon the restoration of peace the present belligerents would be under the necessity of engaging in a spirited contest for the markets of the world. Rumors were persistent that Germany and Austria were formulating plans for an offensive and defensive tariff league or Central European Zollverein to include also Bulgaria and Turkey. Italian and French writers discussed the advisability of offsetting this Teutonic tariff union by a Latin one to include Italy, France, Spain, and their possessions. Representatives of the Allied Powers held a series of economic conferences in Paris in April and July, in Rome in September, and had scheduled one for London in February, 1917. These dealt with a wide variety of economic policies but particularly with trade regulation, international transportation and communication, the creation of an international patent office, and minor matters concerning com-

mercial transactions. The Paris conference in June (noted below) was the most important. In line with these various movements was the proposal for a Pan-American trade league to include all North and South America in a gigantic free and equal trade area as set forth in a bill introduced in Congress by Representative Bailey of Pennsylvania. All of these proposals except the last looked toward the intensification of trade rivalries and the consequent intensification of nationalist sentiments. It seemed evident that, unless the minority opinions in the various countries should somehow gain the ascendancy, all known weapons of trade warfare, including tariffs, reciprocity treaties, bounties, subsidies, and premiums, would be employed on an enlarged scale.

**PARIS CONFERENCE.** By far the most important development of trade policies by the Allied Powers was expressed in the resolutions formulated at the conference of representatives of Great Britain, France, Italy, Belgium, Russia, Japan, Serbia, and Portugal at Paris in June. This resulted from the gradual growth in Great Britain and France of the opinion that some sort of economic entente was necessary in order to restrain the recovery of German prestige in world trade. It was argued that only by checking the growth of economic power in Germany could the threat of a revived militarism be obviated. To in any way contribute to the strengthening of Teutonic trade would, it was said, be to hasten the return of the conditions out of which grew the war.

The proposals of the conference dealt with measures to be taken immediately, those that should operate only during the period of reconstruction after the war, and those that should become permanently effective. As to the first set of measures it was decided to enter upon an immediate and complete boycott of opposed belligerents, this to cover all goods originating in or coming from them and to extend to the subjects of such countries wherever resident. It was determined to so regulate transportation that goods might not reach enemy countries. For the period of reconstruction it was decided to take every possible measure to prevent Germany from recovering her position in international commerce. New tariff treaties would be so formulated as to deprive the Central Powers of the advantage of "most favored nation" clauses; their imports would be specifically restricted and special precautions taken to prevent "dumping" by them. At the same time efforts would be made to develop mutual trade among the Allies so as to reduce dependence upon Germany; and special favors would be extended to the nations devastated by war. Subjects of enemy countries would be prevented from establishing industries inimical to economic independence or national defense. From the standpoint of permanent policy it was recommended that every necessary step be taken by the Allied Powers to render themselves independent of the Central Powers as regards both raw materials and manufactured products by means of government control where necessary, public subsidies, governmental encouragement of scientific research, customs duties, and trade regulations. The Allied Powers were urged to develop interdependence by the perfection of means of transport by land and sea, and communication by mail, telephone, and telegraph,

and by the creation of a uniform system of patents and trade marks.

The proposals of this conference for discriminatory tariffs, economic boycotts, and other trade-war policies, though largely formulated by Bonar Law, one of the British representatives, and afterward formally approved by the British government, failed to win the assent of a large body of leading men in Great Britain and her colonies. The spirit and purpose of the entire set of resolutions was vigorously attacked by such papers as the *Manchester Guardian* and such publicists as Lord Bryce and G. Lowes Dickinson. These objectors pointed out that such policies must react detrimentally upon the interests of British trade and must retard the development of conditions essential to the devoutly desired "Federation of the World." The resolutions, they argued, would, if carried out, continue to divide the world into two hostile camps; natural trade relations would be prevented; and continued irritation would accentuate suspicion and bitterness of international feeling, leading to renewed rivalry in armaments and preparation for new wars. A large group of these opponents drew up a manifesto in which they declared that no grounds had developed for abandoning England's traditional opinion, but that in fact the war had proven the soundness of the free trade policy.

Dominant American opinion was well expressed in the statement of the Free Trade League above noted. The resolutions were in some quarters not taken seriously, being viewed as the result of nervous apprehension rather than sober consideration of economic advantage. It was pointed out that the world is large and that consequently tariff policies must in the long run take account of North and South America, China, neutral parts of Europe, and other parts of the world not at war with whom German trade would be unaffected. Moreover, the geographical position of Russia, even with the Dardanelles open, would force her in her own interests to trade largely with her present enemies. Finally, it was far from clear how a tariff union against the Central Powers could be carried out without necessitating in fact a union against the rest of the world.

Other matter relating to tariff and trade regulation will be found under FINANCIAL REVIEW; and TRUSTS, paragraph *Export Trade*.

**TARKINGTON**, BOOTH. See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, American.

**TARNOWSKI VON TARNOW**, ADAM, COUNT. Appointed Austrian ambassador to the United States in December, 1916. The British government refused an Austrian request for a safe conduct, but when the United States government, through Ambassador Page, said it desired to receive Count Tarnowski, the refusal was withdrawn.

**TASMANIA**. A state of the Commonwealth of Australia, consisting of the island of Tasmania and various smaller islands, most of them in Bass Strait, which separates the state from Victoria. The total area is estimated at 26,215 square miles; Tasmania is thus the smallest of the Australian states, its area being less than 1 per cent of the area of the Commonwealth. The population, according to the census of 1911, was 191,211 (97,591 males, 93,620 females). The increase per cent in the decade 1901-11 was 10.86, in 1891-1901 17.60, in 1881-

91, 26.76. Estimated population June 30, 1915, 198,417. The capital is Hobart, which at the 1911 census had 27,528 inhabitants; including suburbs, 39,937; estimate of Dec. 31, 1914, 39,914.

The executive authority rests with a governor, who is appointed by the crown and is assisted by a responsible ministry. The Parliament consists of two chambers, the Legislative Council (18 members) and the House of Assembly (30 members); members of the Council are elected for six years and those of the Assembly for three. Woman suffrage was granted in 1903. The governor in 1916 (from March, 1914) was Sir William Grey Ellison-Macartney, K.C.M.G.; premier and chief secretary, W. H. Lee. See AUSTRALIA.

**TAXATION**. The most important developments in taxation during the year included the enactment of the Emergency Revenue or Omnibus Revenue bill in Congress, the new Income Tax law of Massachusetts, and various developments regarding the Federal income tax. The new Federal law included a new tax on inheritances, a step which had been strongly urged in the report of the Industrial Relations Commission. As indicated below, various other new taxes were imposed in that measure. In California and Oregon proposals for the enactment of laws establishing the single tax were rejected at the November elections. See also TARIFF and the sections under FINANCIAL REVIEW dealing with the revenue measures of various foreign countries.

**FEDERAL REVENUE**. It became evident early in the year that additional funds would be needed to meet the great expenditures for national defense. The Revenue bill reported in the House July 1st was designed to raise at least \$210,000,000 above previous revenue. But it was at the same time announced that a bond issue of at least \$125,000,000 would be needed to meet the budget of 1916-17 (in December a bond issue of at least \$180,000,000 was contemplated). This measure was finally enacted in September. It imposed additional taxes on incomes, created taxes on inheritance, munitions, and stock, provided various special taxes, and contained provision regarding the tariff (q.v.).

The *Income Tax* sections raised the normal tax from 1 per cent to 2 per cent on incomes above \$4000 for married and \$3000 for single persons, and imposed the following surtaxes: 1 per cent on the amount of net income above \$20,000, but under \$40,000; 2 per cent on net income between \$40,000 and \$60,000; 3 per cent when between \$60,000 and \$80,000; 4 per cent when between \$80,000 and \$100,000; 5 per cent when between \$100,000 and \$150,000; 6 per cent when between \$150,000 and \$200,000; 7 per cent when between \$200,000 and \$250,000; 8 per cent when between \$250,000 and \$300,000; 9 per cent when between \$300,000 and \$500,000; 10 per cent when between \$500,000 and \$1,000,000; 11 per cent when between \$1,000,000 and \$1,500,000; 12 per cent when between \$1,500,000 and \$2,000,000; and 13 per cent on the amount of net income above \$2,000,000. While originally estimated to yield about \$110,000,000, estimates toward the close of the year fixed the yield of this tax for 1916-17 at over \$200,000,000.

The *Inheritance Tax* was as follows: 1 per cent on the amount of net estates under \$50,000; 2 per cent on \$50,000 to \$150,000; 3 per cent on

\$150,000 to \$250,000; 4 per cent on \$250,000 to \$400,000; 5 per cent on \$450,000 to \$1,000,000; 6 per cent on \$1,000,000 to \$2,000,000; 7 per cent on \$2,000,000 to \$3,000,000; 8 per cent on \$3,000,000 to \$4,000,000; 9 per cent on \$4,000,000 to \$5,000,000; and 10 per cent on the amount of net estates over \$5,000,000. This was variously estimated to yield in the neighborhood of \$50,000,000.

The *Munitions Tax* imposed 12½ per cent on the net profits of the manufacture of all kinds of explosives and military supplies including electric motor boats and submarines. This tax is to be in force for one year after the end of the European war.

A *Stock Tax* of 50 cents for each \$1000 of capital, surplus, and undivided profits of corporations and joint stock companies with capitalization above \$99,000 was imposed. The copper tax imposed the following rates on the gross receipts of smelters: 1 per cent when between \$25,000 and \$1,000,000; 2 per cent when receipts exceed \$1,000,000. Special taxes were imposed on pawn-, ship-, and custom-house brokers, theatres and places of amusement according to seating capacity, bowling alleys and billiard tables, and tobacco manufacturers according to volume of sales. Various modifications were made in the liquor tax rates, and previous stamp taxes were repealed.

**INCOME TAX COLLECTIONS.** The annual report of the Commissioner of Internal Revenue showed that collections under the Federal Income Tax for the fiscal year 1916 totaled \$124,937,252, a gain of \$44,700,000, or 55 per cent over the preceding year. The tax on corporations yielded \$56,993,658, an increase of \$17,800,000 over the preceding year; that on individuals yielded \$67,943,594, a gain of \$26,800,000.

Returns were received from 336,443 corporations, or 67,000 more than in 1915. This increase, however, was due in part to delayed reports of 1915. Aggregate income of \$5,184,442,000 was returned by 190,911, while 175,532 reported either operating deficit or no taxable income. From each of 15 different districts the corporation tax yielded more than \$1,000,000; that including New York City yielded \$10,093,000; that including Chicago, \$4,591,000; the first Pennsylvania, \$3,203,000; the 23rd Pennsylvania, \$2,980,000; and the 3rd Massachusetts, \$2,858,000.

Individual income taxes were paid by 336,652 persons. Of these 266,153 were married, 47,583 were single men, and 22,916 were single women. The collections of the normal tax, that is on incomes under \$20,000, amounted to \$23,995,000, an increase of \$7,436,000 over 1915. Incomes from \$20,000 to \$50,000 paid \$6,091,000; those from \$50,000 to \$75,000 paid \$4,071,000; those from \$75,000 to \$100,000 paid \$3,623,000; those from \$100,000 to \$250,000 paid \$10,936,000; those from \$250,000 to \$500,000 paid \$6,393,000; and those above \$500,000 paid \$12,647,000. This last group showed an increase of \$6,208,000, the largest increase for any class of incomes. Only 120 persons paid taxes on net incomes exceeding \$1,000,000, and 74 of these resided in New York State; 209 paid on incomes from \$500,000 to \$1,000,000; 592 paid on sums from \$250,000 to \$500,000; 2906 paid on incomes from between \$100,000 and \$250,000; 2056 on incomes between \$75,000 and \$100,000;

4791 on incomes between \$50,000 and \$75,000; 4100 on incomes between \$40,000 and \$50,000; 7005 on incomes between \$30,000 and \$40,000; 6196 on incomes between \$25,000 and \$30,000; 9707 on incomes from \$20,000 to \$25,000; 16,475 on incomes between \$15,000 and \$20,000; 34,102 on incomes between \$10,000 and \$15,000; 120,402 on incomes between \$5000 and \$10,000; 58,949 on incomes from \$4000 to \$5000; and 69,045 on incomes below \$4000.

Students of the income tax returns pointed out that residents in and about New York City paid about one-half of the total tax, and that 70 per cent of the tax was paid by residents of the following States: New York, \$30,252,000; Pennsylvania, \$6,313,000; Illinois, \$5,166,000; Massachusetts, \$4,193,000; New Jersey, \$2,928,000; and Ohio, \$2,416,000. This result was in part due to the supertax, these States including the vast majority of persons having the higher incomes.

The commissioner recommended that certain changes be made in the law. He thought returns of annual gross income of \$3000 or over should be required instead of returns of annual net incomes of such amounts. He recommended that the filing of returns in the district in which the person has his legal residence be required. He contended that the provision requiring the deduction of the normal income tax at the source should be repealed except in the case of non-resident alien and corporations receiving income from the United States; and that instead the law require a statement of the source of income in the returns. He thought this would permit a closer control over the assessment of income.

**CONSTITUTIONALITY.** On January 24th the United States Supreme Court in the case of *Brushaber v. Union Pacific R. R. Co.*, rendered a long-awaited opinion regarding the constitutionality of the income tax section of the *Tariff Act of 1913*. The question at issue involved primarily the constitutionality of the 16th Amendment to the United States Constitution, which authorizes the imposition and collection of an income tax. The objections that had been raised were as follows: In the first place it was argued that the actual law was not in harmony with the 16th Amendment which authorized the levying without apportionment of a direct tax of special character; secondly that since the amendment authorized the taxation of incomes "from whatever source derived" the exclusion of incomes of certain persons and classes would be unconstitutional, unless the tax were apportioned; in the third place the statute is in some of its provisions retroactive, but the incomes of the retroactive period could be taxed only under the preëxisting constitutional provisions regarding apportionment. The Court held that these contentions would cause one constitutional provision to conflict with another, that is, would result in conflict between the general requirement that all direct taxes be apportioned and the specific provision of the amendment exempting an income tax, which is a direct tax, from apportionment. Moreover, this amendment which authorizes a direct tax removes such tax from the rule of uniformity which the Constitution applies to other direct taxes, thus making it possible even to impose different rates in different States. The Court held that the specific object of the 16th Amend-

ment was not to confer power to levy income taxes in general, nor to distinguish between one kind of income taxes and another, but to exempt all income taxes from the requirement of apportionment and from consideration as to source of income. The Court also held that this amendment does not change the established interpretation of the term "direct tax," except in so far as may be necessary to secure the results aimed at. With reference to the progressive feature of the law the Court pointed out that extensive objections had been made to this provision as transcending established rules of taxation and constituting an arbitrary abuse of power, but that these objections overlooked the fact that progressive taxes had been imposed at various times in American history and hence "in this situation it is, of course, superfluous to say that arguments as to the expediency of levying such taxes or of the economic mistake or wrong involved in their imposition are beyond judicial cognizance."

On February 21st the Supreme Court handed down decisions in a number of cases involving (1) the constitutionality of the surtax, that is, the excess tax on higher incomes, and (2) the question whether income derived from or accompanied by the physical deterioration of property is taxable to the same extent and in the same manner as income resulting only from current operations. The Court found that objections to the statute had been made on the ground that the surtax was not authorized by the 16th Amendment and hence exceeded the power conferred upon Congress; and that this surtax is unconstitutional partly because its provisions are retroactive in operation and partly because it creates illegal discriminations and inequalities. These contentions were set aside by the Court's opinions, which, taken as a whole, constituted a wide justification of the surtax provisions under all probable circumstances.

One of these cases, *Stanton v. Baltic Mining Company*, was based on the contention that the income of mining companies consisted in part of capital depreciation, and that consequently the statute was in effect discriminatory in its application to such companies. The Court overruled the objections and with reference to the income of mining companies held that it is unreasonable to consider that the gradual exhaustion of the ore body which must result from working a mine causes the tax in a case where inadequate allowance is made for the exhaustion of the ore body to become a tax on property and therefore subject to apportionment. The opinion held that there is no ground for the view that a tax on the product of a mine is necessarily a direct tax on property, but that such view is "wholly fallacious."

**MASSACHUSETTS.** The Legislature of Massachusetts enacted an income tax law applicable to incomes of the calendar year 1916 and thereafter. Returns must be made on or before March 1st by each person, partnership, association, or trust whose annual income exceeds \$2000. Return, however, need not be made of income from real estate, certain exempted dividends, interest on bonds of the United States, or of Massachusetts or any of its political divisions, or wages received from the United States. The act provides a 6 per cent tax on the incomes from such forms of intangible property as had previously been taxable, and a tax

of 1½ per cent on incomes derived from trades, professions, and annuities, together with a tax of 3 per cent on profits derived from dealings in intangible personal property. The 6 per cent tax is assessed on incomes from bonds, notes, money at interest, and debts due, but income from the following sources is exempt: savings deposits, bonds of local, Massachusetts, and Federal governments, and mortgages on Massachusetts real estate. Other income subject to the 6 per cent tax includes dividends of companies organized in other States (except national banks, and railway, telephone, and telegraph companies doing business in the State), and dividends of partnerships, associations, and trusts with certain exemptions. From the 6 per cent tax are exempted interest paid on debts of various kinds, and \$300 when the total income of the taxpayer from all sources is less than \$600. From the 1½ per cent tax are exempted expenses actually connected with trade or profession (not including family expenses nor premiums for use and occupancy insurance or rent insurance); a reasonable allowance for depreciation of property used; taxes; interest on trade or business indebtedness; business losses; 5 per cent of the assessed value of tangible property used in the business; debts arising since Dec. 31, 1915, and paid during the year; income taxed under the 6 per cent sections of the law; and the following: \$500 for a husband or wife, \$250 for each child under 18 years, and \$250 for each parent who is entirely dependent, but these last items may not exceed \$1000. Thus men with families have a total of \$3000 of income exempted besides exemptions due to interest, debts, and other items above mentioned. Some effort is made to secure information as to the source of incomes by requiring all employers in the State to file names of employees receiving over \$1800 a year; requiring a similar return from city, town, and county treasurers, and the State auditor; and requiring corporations and trusts to file names of all shareholders.

**TRADING STAMP DECISIONS.** In April the Supreme Court rendered decisions in various cases growing out of the use of trading stamps in advertising and selling goods. A statute of the State of Washington imposing a very high license tax upon all commerce using trading stamps was attacked as unconstitutional, because not equal and uniform in operation, because it deprived complainants of their liberty and property without due process of law, and for other reasons. The Court held that the State's police power could be extended to include complete prohibition of the use of trading stamps; and that the power of taxation, being equivalent to the power to destroy, readily comprises the license taxes in question. With reference to the economic justification of the trading stamp the Court held that since companies using it found it profitable "there must, therefore, be something more in it than the giving of discounts"; "it may well be thought there is something in it which is masked from the common eye and that the purchaser at retail is made to believe that he can get more out of the fund than he has put into it."

**TAYLOR, JAMES MONROE.** An American educator, died in New York City, Dec. 19, 1916. He was born in Brooklyn, N. Y., in 1848 and graduated from the University of Rochester in 1868 and from the Rochester Theological Semi-



nary in 1871. After his ordination to the Baptist ministry, he occupied pastorates at South Norwalk, Conn., and Providence, R. I., until 1886, when he was called to the chair of ethics in and the presidency of Vassar College. In this latter office, which he held until his retirement as president emeritus in February, 1914, Dr. Taylor became known as one of the leading educators of the country. During his administration the number of buildings increased from 5 to 30, the students from 312 to 1000, the college property from 200 acres to 700, and the faculty from 35 members to 112. As an important part of his work for the welfare of the college, he interested in it John D. Rockefeller, Mrs. Russell Sage, and other wealthy and influential persons. He was succeeded as president by Dr. Henry Noble MacCracken. Dr. Taylor served as a member of the committee of 10 named by ex-President (then President) Eliot of Harvard to investigate the relations between secondary schools and colleges, with a view to a better correlation. Honorary degrees were conferred on him by Rochester, Yale, Rutgers, and Smith, and a new art building at Vassar was named for him. He published *Elements of Psychology* (1892); *Before Vassar Opened* (1914); and, with Elizabeth H. Haight, *Vassar* (1915).

**TEACHERS COLLEGE.** A non-sectarian co-educational institution in New York City, one of the schools of Columbia University. It was founded in 1888. In the various departments in the fall of 1916 there were 2141 students enrolled. The faculty (not including officers of the Horace Mann and Speyer Schools of the college) numbered 188. Productive funds amounting to \$2,399,847 yielded in 1916 an income of \$122,339. There were 6500 volumes in the library. President of Columbia University, Nicholas Murray Butler; dean of Teachers College, James Earl Russell.

**TEACHING, CARNEGIE FOUNDATION FOR THE ADVANCEMENT OF.** See UNIVERSITIES AND COLLEGES, section so entitled.

**TELEPHONY.** There was no striking development in the art of telephony during 1916. Trans-continental communication had already been made commercially successful, as mentioned in the 1915 YEAR BOOK. The year 1916, however, was one showing a steady growth in the use of the telephone, the amount of business done, and the extension of existing lines. Mr. Burleson, the Postmaster-General, in his annual report called attention as he had done in the previous year to the, in his opinion, necessity of government ownership and operation of all telegraph and telephone lines. The general opinion as expressed in newspaper and magazine comment was opposed to this view. Public service commissions of various States were disposed to take a more liberal attitude towards the existing telephone lines where the question of competition by independent companies was involved; thus in several cases where application was made for an extension in competition with the existing company, permission was refused on the ground that the extension asked for would not result in any greater convenience to the public. It was generally found that the existence of two separate companies in the same territory had this result: lower efficiency and less public benefit. On the other hand, the enterprise and virility of the independent com-

panies was noticeably increasing in that particular portion of the United States where they had become most firmly established. Intense rivalry and in many cases bitter feeling between the independent telephone companies and those constituting the Bell system were but slightly diminished, yet there was an increasing amount of interchange of business at connecting points. The United States Independent Telephone Association, formed in 1915, held its first annual convention at Chicago in December and reported encouraging progress on the year's work. There was an increasing number of inter-connection between the lines of this association and those of the Bell system (American Telephone and Telegraph Company).

It was reported that there were 20,500 telephone exchanges in the United States, of which 6000 were in the Bell group, and the remainder, those of the independent companies. The Independent Association referred to controlled directly 600 subsidiary corporations and indirectly about 6000 small companies. There were 1200 exchanges competing directly with those of the Bell company. Some slight progress was made in the construction and development of so-called automatic exchanges during the year. These had been improved over the types formerly built, and appeared to give general satisfaction. The opinion of prominent telephone engineers tended to the view that many more automatic features must be incorporated as fast as practicable in the regular manually operated exchanges owing to the increasing cost of labor, but any changes in this direction must be adopted with the greatest care and discrimination.

An interesting achievement of the year was the connection established at the Massachusetts Institute of Technology, Boston, on the occasion of an important meeting, with 35 different cities at the same time. The connections and resulting conversation were highly satisfactory and were of distinct importance when it is realized that the most distant of these 35 cities, namely, New Orleans and Seattle, were 4850 miles apart, and that the simultaneous connection involved the use of 74,532 miles of line. The value of this experiment with reference to times of national danger or emergency, can hardly be overestimated. As in many localities trouble had been experienced with the so-called inductive disturbances where telephone lines were near electric power lines, increasing efforts were made to avoid this sort of trouble, not only by separating the two circuits more widely, but by certain devices which were adopted that would minimize the induction due to the power circuit. The most troublesome instances of this kind were usually found near electric inter-urban or electrified steam railroads. At a few colleges and technical institutions special courses in the theory and practice of telephone engineering were established. The experiment had not proceeded far enough to give any conclusive results as to the practical benefits to the students, however.

**TELESCOPES.** See ASTRONOMY.

**TEMPERANCE.** See LIQUOR REGULATION; LIQUORS; and various States of the United States, under the section *Politics and Government*.

**TENNESSEE. POPULATION.** The estimated population of the State on Dec. 31, 1916, was

2,296,316. The population in 1910 was 2,184,789.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16, were as follows:

	<i>Acreage</i>	<i>Prod. Bu.</i>	<i>Value</i>
Corn ..... 1916	3,250,000	84,500,000	\$79,430,000
..... 1915	3,450,000	98,150,000	54,027,000
Wheat ..... 1916	865,000	7,958,000	13,449,000
..... 1915	860,000	9,030,000	9,752,000
Oats ..... 1916	860,000	7,560,000	4,687,000
..... 1915	857,000	8,746,000	4,373,000
Potatoes ... 1916	36,000	2,952,000	4,898,000
..... 1915	36,000	3,168,000	1,996,000
Hay ..... 1916	1,050,000	1,449,000	21,785,000
..... 1915	950,000	a 1,396,000	19,404,000
Tobacco ... 1916	102,200	b 81,760	8,258,000
..... 1915	92,900	b 69,675	4,890,000
Cotton ... 1916	878,000	378,000	35,285,000
..... 1915	772,000	c 303,000	16,407,000
Rye ..... 1916	15,000	150,000	202,000
..... 1915	18,000	189,000	195,000
Barley ... 1916	10,000	237,000	237,000
..... 1915	8,000	192,000	144,000

a Tons. b Pounds. c Bales.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments .	4,609	4,775
Average number of wage earners .....	73,840	74,373
Capital invested .....	\$167,924,000	\$211,423,000
Wages .....	28,251,000	33,083,000
The value of materials used	104,016,000	123,430,000
The value of products ....	180,217,000	212,071,000

**MINERAL PRODUCTION.** The estimated production of coal in 1916 was 6,560,000 tons, an increase compared with 1915 of 830,000 tons or 14 per cent. The most important influence causing this increase was the demand for coke and coal by the iron industry. Railroad consumption of coal was greater than in 1915, and all the industries in the State and in near by States, which depend on this coal, were in full operation, and using a maximum quantity of fuel. During the first half of the year the car supply was ample, and operators were able to furnish all the coal required. During this period there was a surplus of labor. In the last half of the year, however, there was a shortage of cars and of labor.

The production of the iron ore in 1915 was 284,185 gross tons, compared with 330,214 tons in 1914. The ore shipped from the mines in the State in 1915 was valued at \$408,204, compared with a value in 1914 of \$330,214.

**TRANSPORTATION.** The steam railway mileage of the State in 1916 was 4217. There was no new construction of railways in the State during the year.

**EDUCATION.** The latest statistics for education are for 1914. In that year the total school population was 776,895. There were enrolled in the public schools 593,437, with an average daily attendance of 431,053. The total number of teachers, male and female, numbered 12,578. The expenditures for schools amounted to \$6,064,653.

**FINANCE.** The latest statistics available for

the finances of the State are for the biennial period 1912-14. There was a balance on Dec. 20, 1912, of \$785,120. The receipts for the biennial period amounted to \$9,166,870, and the disbursements to \$9,779,579, leaving a balance on Dec. 20, 1914, of \$172,410. The interest bearing debt of the State amounted on Jan. 1, 1915, to \$11,781,000.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include three hospitals for the insane, the Tennessee Deaf and Dumb Schools, Tennessee School for the Blind, Confederate Soldiers' Home, Tennessee Industrial School, Tennessee Reformatory for Boys, the Blind Girls' School, and State Penitentiary. The total amount paid to charitable institutions and for pensions from 1883 to 1914 amounted to \$31,224,163.

**POLITICS AND GOVERNMENT.** The Legislature did not meet in 1916. There was little local excitement over the campaign. Governor and other State officers were elected on November 7th. The Democratic candidate, Thomas C. Rye, received 146,759 votes, compared with 118,749 cast for Overall, his Republican opponent. For United States Senator McKellar, Democrat, was elected with 143,718 votes, compared with 118,138 votes cast for Hooper, his Republican opponent. For President, Wilson received 152,955 votes, as against 116,257 cast for Hughes. All Democratic State officers were elected.

**OTHER EVENTS.** A new Harahan bridge, across the Mississippi River at Memphis, said to be the largest structure on the river, was opened for traffic in September. Including the approaches it is three miles long, and costs approximately \$5,000,000. Construction on it was begun in 1913. On March 22nd, a fire in Nashville destroyed 600 buildings, chiefly in the residential section, and caused a loss of \$1,500,000. Among other buildings four churches were burned. The experiment of working negro convicts on the roads of the State has been so successful that the State Board of Control in January decided that the plan was a great improvement upon the old contract system. Of 55 State prisoners, all negroes, who worked on the roads of Williamstown County, during the summer of 1915, only three attempted to escape. The health and conduct of the prisoners were much better than under the old system. Contracts for such labor in other counties were made in 1916.

**STATE OFFICERS.** Governor, Thomas C. Rye; Secretary of State, R. R. Sneed; Treasurer, Porter Dunlap; Auditor, Hayes Flowers; Commissioner of Agriculture, H. K. Bryson; Superintendent of Education, S. W. Sherrill; Comptroller, John B. Thomason; Adjutant-General, Charles B. Rogan; Attorney-General, Frank M. Thompson; Commissioner of Insurance, William F. Dunbar—all Democrats.

**JUDICIARY.** Supreme Court: Chief Justice, M. M. Neil; Justices, S. C. Williams, D. Lansden, Arthur S. Buchanan, and Grafton Green; Clerk, Preston Vaughn.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Democrats .....	27	72	99
Republicans .....	6	27	33
Democratic majority .	21	45	66

**TENNESSEE, UNIVERSITY OF.** A non-sectarian co-educational institution at Knoxville, Tenn., founded in 1794. Not including the medical, dental, and pharmacy departments there were 740 students in the fall of 1916. The faculty numbered 200. Among appointments the most important were: David R. Lee as professor of Greek; Frank F. Frantz as professor of French; John A. Thackston as professor of education; and Frank M. Darnall as acting professor of English. There are 40,000 volumes in the library. President, Brown Ayres.

**TENNIS.** The European war again prevented the holding of international tennis matches in 1916. The playing of Richard Norris Williams, 2d, of Philadelphia was the feature of the year in the United States. Williams regained the championship in the singles, which he had held in 1914, through his defeat of William M. Johnston, the 1915 title holder, in the final round of the national tourney at Forest Hills, Long Island.

The victory of Williams was sensational in that when he and Johnston retired at the end of the third set the Californian led by two sets to one, having overwhelmed Williams in the third set by a 6-0 score. The Philadelphia player by a wonderful display of stamina and aggressiveness turned the tables in the fourth set to the tune of 6 to 2 and in the final set triumphed by a score of 6 to 4.

Johnston and Clarence J. Griffin, also a Californian, retained the national doubles title by their victory over the challenging team comprising Maurice E. McLoughlin and Ward Dawson, both of California.

The tour of the United States by Itchiya Kumagae of Japan aroused considerable interest among followers of the sport. Kumagae won several notable victories, numbering among his victims the brilliant Johnston, whom he defeated in a tournament held at Newport, R. I.

Miss Molla Bjurstedt of Norway, the 1915 women's champion, had no difficulty in disposing of her opponents. She not only retained the national title but carried off the honors on the indoor and clay courts, stamping herself the greatest player of her sex in the history of the game.

A summary of the principal tournaments held in the United States follows:

All-Comers' National at Forest Hills, L. I. Men's Singles, final round, R. Norris Williams, 2d, defeated William M. Johnston 4-6, 6-4, 0-6, 6-2, 6-4; men's doubles, challenge round, W. M. Johnston and C. J. Griffin defeated M. E. McLoughlin and Ward Dawson 6-4, 5-7, 6-3.

Women's National at Philadelphia, Pa. Singles, final round, Miss Molla Bjurstedt defeated Mrs. Edward Raymond 6-0, 6-1; doubles, final round, Miss Molla Bjurstedt and Miss Eleanora Sears defeated Miss Edna Wildey and Mrs. Edward Raymond 4-6, 6-2, 10-8; mixed doubles, final round, Miss Eleanora Sears and W. E. Davis defeated Miss Florence Ballin and W. T. Tilden, 6-4, 7-5.

Clay Court at Cleveland, Ohio. Men's singles, final round, W. E. Davis defeated C. B. Doyle 6-2, 7-5, 6-3; challenge round, W. E. Davis defeated R. Norris Williams, 2d, by default; doubles, final round, George M. Church and Dean Mathey defeated W. E. Davis and H. V. D. Johns 7-5, 6-0, 6-2. Women's singles, final round, Miss Molla Bjurstedt defeated Miss

Martha Guthrie 8-6, 6-3; mixed doubles, final round, Miss Molla Bjurstedt and George M. Church defeated Mrs. H. W. Bickle and C. B. Doyle 6-1, 6-2.

National Indoor at New York City. Singles, final round, Robert L. Murray defeated Alrick H. Man, Jr., 6-2, 6-2, 9-7; doubles, final round, Dr. William Rosenbaum and Arthur Lovibond defeated King Smith and A. S. Cragin 3-6, 1-6, 6-4, 8-6, 10-8.

Women's National Indoor at New York City. Singles, final round, Miss Molla Bjurstedt defeated Mrs. Frederick Schmitz 6-2, 6-1; doubles, final round, Miss Molla Bjurstedt and Miss Marie Wagner defeated Mrs. S. F. Weaver and Mrs. Frederick Schmitz 6-1, 6-3.

Intercollegiate at Haverford, Pa. Singles, final round, G. C. Caner, Harvard, defeated J. S. Pfaffman, Harvard, 6-3, 6-1, 5-7, 6-2; doubles, final round, G. C. Caner and Richard Harte, Harvard, defeated J. S. Pfaffman and W. P. Whitehouse, Harvard, 6-3, 6-1, 6-2.

Junior and Boys' at Forest Hills, L. I. Junior, final round, Harold Throckmorton defeated Roland Roberts 7-5, 6-4, 6-4; boys', final round, Benjamin Letson defeated D. W. Johnson 6-0, 6-0, 6-1.

Metropolitan at Bronxville. Men's singles, final round, George M. Church defeated Dean Mathey 6-3, 6-4, 9-7; doubles, final round, George M. Church and Dean Mathey defeated H. H. Hackett and W. M. Hall 6-1, 6-3; women's singles at Forest Hills, final round, Miss Molla Bjurstedt defeated Miss Martha Guthrie 6-2, 6-0; doubles, final round, Mrs. Rawson Wood and Mrs. S. F. Weaver defeated Miss Molla Bjurstedt and Miss Marie Wagner 6-1, 4-6, 6-4.

Pacific Coast at Del Monte, Cal. Men's singles, final round, W. M. Johnston defeated C. J. Griffin, 9-7, 7-5, 6-8, 8-6; doubles, final round, W. M. Johnston and C. J. Griffin defeated J. C. Rohlf and B. Detrick, 6-2, 6-2, 8-6. Women's singles, final round, Miss Baker defeated Miss Thorn 8-6, 6-4; doubles, final round, Miss Baker and Miss Myers defeated Miss Casel and Mrs. Cushing 6-4, 6-3.

Newport Invitation at Newport, R. I. Singles, final round, Itchiya Kumagae defeated W. M. Johnston 6-1, 9-7, 5-7, 2-6, 9-7; doubles, final round, J. J. Armstrong and W. F. Johnson defeated C. J. Griffin and W. M. Johnston 4-6, 6-2, 6-1, 3-6, 9-7.

**TERAUCHI, SEIKI, COUNT.** A Japanese statesman, appointed premier Oct. 4, 1916, to succeed Marquis Okuma. The increasing strength of the bureaucratic party forced Okuma's resignation, and the choice of Count Terauchi was regarded as a blow to the advocates of a representative government. Okuma, after his own fall, had endeavored to help Baron Kato to form a ministry by a coalition of several groups which left only the Conservative army party in opposition. Terauchi, although he was said to favor a no-party system of government, was claimed by the Conservatives. He succeeded in forming a cabinet, which was announced on October 9th. Count Terauchi (pronounced terra-oochi, 'inside the temple'), was born in 1853 and had become a sub-lieutenant in the army by the time of the Saigo rebellion in 1877. During the Chino-Japanese War he rendered valuable service in the ministry of war, and during the Russo-Japanese War, he headed

this ministry. He has been credited with formulating the army expansion policy carried out by Japan in recent years, and with the coup that accomplished the annexation of Korea. When resident-general in Korea, he gained a reputation for his vigorous policing of the country. It was expected that as head of the ministry he would insist on a more vigorous foreign policy, dictated by expansionist views.

**TERRESTRIAL MAGNETISM.** See PHYSICS.

**TETANUS.** The 14th annual summary of Fourth of July injuries, made by the *Journal* of the American Medical Association, of the statistics of deaths and injuries resulting from the celebration of the Fourth of July, indicates that the "safe and sane" propaganda is steadily spreading. For the first time not a single case of tetanus was reported, whereas in 1903, the first year the statistics were compiled, 417 cases occurred. Thirty fatalities were directly due to fireworks, 10 being burned to death, 9 dying from gunshot wounds, 4 from explosions of toy cannons, 3 from explosions of powder, 3 from blood poisoning, and 1 was killed by a mammoth firecracker. The total number of non-fatal injuries was 820; of these 10 lost one eye each, 9 lost legs, arms, or hands, and 24 lost one or more fingers. Firearms were responsible for 118 injuries; giant crackers, 222 injuries; cannons, 84 injuries. As usual, many of these casualties were due to stray bullets from the reckless shooting of firearms. In 1916 New York City had the greatest number of accidents, namely, 7 killed and 79 injured; and Philadelphia, 1 killed and 73 injured. The *Journal* points out that, as a result of its campaign, the number of deaths has been reduced from 215 to 30; the deaths from lockjaw from 125 to 0; and the total of deaths and injuries from 5460 to 850. See also SEROTHERAPY.

**TEXAS. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 4,472,494. The population in 1910 was 3,896,542.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16, were as follows:

	Acreage	Prod. Bu.	Value
Corn . . . . . 1916	6,900,000	131,100,000	\$136,344,000
1915	7,100,000	166,850,000	96,778,000
Wheat . . . . . 1916	1,200,000	13,200,000	22,836,000
1915	1,650,000	25,575,000	27,365,000
Oats . . . . . 1916	1,500,000	42,750,000	26,078,000
1915	1,500,000	53,250,000	22,365,000
Rice . . . . . 1916	235,000	10,575,000	9,094,000
1915	260,000	7,980,000	7,058,000
Potatoes . . 1916	40,000	2,000,000	3,800,000
1915	42,000	2,780,000	2,866,000
Hay . . . . . 1916	480,000	576,000	6,048,000
1915	450,000	a 765,000	6,044,000
Tobacco . . . 1916	200	140,000	28,000
1915	200	b 100,000	27,000
Cotton . . . . 1916	11,517,000	8,775,000	850,796,000
1915	10,510,000	c 3,227,000	171,697,000
Rye . . . . . 1916	2,000	20,000	24,000
1915	2,000	34,000	35,000
Barley . . . . 1916	9,000	153,000	122,000
1915	9,000	252,000	171,000

a Tons. b Pounds. c Bales.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments . . . . .	4,538	5,084
Average number of wage earners . . . . .	70,280	74,853
Capital invested . . . . .	\$216,876,000	\$283,544,000
Wages . . . . .	37,907,000	44,821,000
The value of materials used . . . . .	178,178,000	253,144,000
The value of products . . . . .	272,896,000	361,279,000

**MINERAL PRODUCTION.** The coal production of the State in 1916 is estimated at 1,800,000 tons, or 289,000 tons less than in 1915. The decrease was mainly in the bituminous districts. A strike that closed many of the mines during September was the chief cause of the decrease, as the demand for coal by railroads and industries was good, and the supply of cars and labor was abundant during the year.

The production of petroleum in Texas in 1915 surpassed all previous records, and placed the State third in rank among the oil-producing States. The total production was 24,942,701 barrels, compared with 20,068,184 barrels in 1914.

The output of the metals mined in 1916 amounted to \$600,000 in gold, 680,000 ounces of silver, 600,000 pounds of lead, and 100,000 pounds of copper, compared with \$1503 in gold, 675,473 ounces of silver, 219,299 pounds of lead, and 421,209 pounds of copper in 1915.

The output of metal mined in 1915 had a total value of \$365,480, compared with \$313,787 in 1914. Silver is the principal metal produced.

**TRANSPORTATION.** The railroad mileage of the State on June 30, 1916, was 15,655 miles of main track and branches, with 4208 miles of yard tracks and sidings.

**EDUCATION.** The latest available statistics are for 1914. In that year the school population was 1,433,476. The enrollment was about 870,000. Measures passed by the Legislature of 1915 went into effect in 1916. These included a compulsory attendance law. The Legislature also established a county board of education, and appropriated money for the purpose of establishing a department of vocational training in high schools. Three assistant superintendents were provided for.

**FINANCE.** The latest statistics available for the finances are for 1914. There was a balance on Aug. 31, 1913, of \$333,615. The receipts amounted to \$14,274,728, and the disbursements to \$12,886,734, leaving a balance on Aug. 31, 1914, of \$1,721,609.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include the State Penitentiary at Huntsville, State Penitentiary at Rusk, Insane Hospitals at Austin, Terrel, and San Antonio, State Orphans' Home at Corsicana, State Epileptic Colony at Abilene, Deaf and Dumb Institute at Austin, Confederate Soldiers' Home, Confederate Women's Home, and the Deaf, Dumb, and Blind Institute for Colored Youths at Austin, State Juvenile Training School at Gatesville, State Tuberculosis Sanatorium at Carlsbad, and the Girls' Training School at Gainesville.

**POLITICS AND GOVERNMENT.** The most important political campaign during the year in Texas was the contest for United States Senator, which was won in the run-off primary by United States Senator Charles A. Culberson, his opponent being former Gov. O. B. Colquitt. This was the first year that Texas had non-

inated candidates for United States Senator under the direct primary system. In the first primary, held July 22nd, there were five prominent candidates for the Democratic nomination for United States Senator, namely, the incumbent, Mr. Culberson, former Gov. O. B. Colquitt, Dr. Samuel Palmer Brooks, president Baylor University, and Congressman Robert L. Henry, chairman of the rules committee, House of Representatives. In the first primary Mr. Colquitt received a plurality of the votes, his nearest opponent being Senator Culberson. Under the law these two aspirants ran off the race a month later. In the contest Senator Culberson was nominated by an overwhelming majority. The issue in the Culberson-Colquitt campaign was a straight-out endorsement of the Wilson administration. Mr. Colquitt was the leading opponent of the President in Texas within the Democratic party and rallied to his standard most of the so-called German-American voters and other Democrats who were displeased with the Wilson administration. Just before retiring from office Governor Colquitt in 1914 gave out an interview to the newspapers in which he denounced the Wilson administration as a complete failure. This interview and his subsequent course, together with his obtaining a plurality in the first primary, caused the issue to be very definitely drawn between himself and Senator Culberson, who was known throughout the nation to be one of President Wilson's staunchest supporters. An effort was made within the Democratic party by the prohibition element to defeat Gov. James E. Ferguson for reelection, his opponent being Charles H. Morris. The campaign resulted in the renomination and subsequent election, of course, of Governor Ferguson by a large majority. The Democratic party by a small vote declared for the submission of a constitutional amendment prohibiting the liquor traffic. The Democratic convention, however, did not embrace this demand in the platform drawn at Houston and the contest was to be renewed before the Legislature in January. President Wilson received 285,909 votes and Hughes 69,949.

**OTHER EVENTS.** The 80th anniversary of the signing of the Texas Declaration of Independence was celebrated on March 2nd at the city of Washington. This city, which is now almost deserted, was twice the capital of the Republic of Texas. Fifty acres of land have been purchased in the neighborhood for a State park. Near the centre of this tract stands a grand shaft commemorating the signing of the declaration and the establishment of the Republic of Texas. On March 21st a fire in the city of Paris destroyed more than 30 blocks of buildings in the residential portion of the city. Out of 140 business structures only 15 were left standing. Almost the entire business section of the city was destroyed, and with it the main part of the residence section. Only one life was lost, but property lost was valued at \$5,000,000. Additional improvements to the Houston Ship Canal, which was completed in 1914, were begun in 1916. There has been planned a channel 250 feet wide with a minimum depth of 35 feet, to develop the channel above a turning basin and nearer the city, at a cost of \$10,000,000. The construction includes wharves and cotton sheds. The turning basin will be widened to a diameter of 1100 feet. These im-

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provements are to be owned and operated by the city. It is expected that Houston will share in trade developed by the opening of the Panama Canal. On March 6th a fire in the city jail of El Paso caused the death of 18 Mexican prisoners who were confined there. The fire was believed to have been caused by the throwing of a lighted match into a disinfecting mixture which exploded. During the fire a Mexican outside the jail spread a rumor that 200 Mexicans had been thrown into jail and deliberately burned to death. He boarded a street car, and shot and killed Charles Phelps, a motorman.

**STATE OFFICERS.** Governor, James E. Ferguson; Lieutenant-Governor, W. P. Hobby; Secretary of State, John G. McKay; Adjutant-General, Henry Hutchings; Attorney-General, Benjamin F. Looney; State Treasurer, J. M. Edwards; Comptroller, H. B. Terrell; Superintendent of Public Instruction, W. F. Doughty; Land Commissioner, J. T. Robison; Commissioner of Agriculture, Fred W. Davis; Commissioner of Insurance, John S. Patterson—all Democrats.

**JUDICIARY.** Supreme Court: Chief Justice, Nelson Phillips; Associate Justices, James E. Yantis and W. E. Hawkins; Clerk, F. T. Connerly.

**STATE LEGISLATURE:**

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Democrats .....	81	142	178
Republicans .....	..	1	1
Democratic majority ..	81	141	172

**TEXAS, UNIVERSITY OF.** A co-educational State institution at Austin, Texas. The medical department of the university is at Galveston. In the fall of 1916 there were 2465 students, exclusive of medical students, who numbered 333. There were 261 faculty members. The new president of the university, Dr. Robert Ernest Vinson, formerly president of the Austin Presbyterian Theological Seminary, took office on July 1st, and was inaugurated November 30th. The university owns land, the estimated value of which is \$2,060,000 and in 1916 drew an income of \$180,000. In the library were 122,906 volumes.

**TEXAS FEVER.** See **VETERINARY MEDICINE.**

**TEXTILE MANUFACTURING.** In practically all branches of this great American industry, the year 1916 was one of activity and prosperity, marked by increased production and high prices, with greater exports due to the European war. In most fields there were greatly increased costs of raw materials, machinery, and labor, while there was a general scarcity of shipping and also high freight rates. As regards colors the situation improved very much, but shades were regulated in the main with due consideration of the American dyes available. In some industries there were labor difficulties, as among the manufacturers of such articles as cloaks and suits, that had their effect, but in the main the various industries passed through an active and trying year in a manner satisfactory to most interests concerned.

The activity in cotton manufacturing was shown by the fact that the consumption of cotton in the United States broke all records in the 12 months ended July 31st. The consump-

tion was placed at 6,397,613 bales, as compared with 5,597,362 bales in 1914-15, showing a gain of 14 per cent over the previous high record. In addition to this, there were 880,916 bales of linters used, or more than double the quantity used in the previous year. The large gain in mill consumption was due to the increase in the development of American mills, especially in the South; but the great increase in linters consumption was due to the demand for a short-staple fibre in the manufacture of explosives. The accompanying table shows the number of active spindles, annual mill consumption, and the quantity of linters used in the American Union in the five years ended July, 1916, inclusive:—

Year	Spindles	Mill Consumption	Linters Used
1912	30,578,528	5,129,846	288,287
1913	31,519,766	5,488,821	808,089
1914	32,107,572	5,577,408	807,325
1915	31,964,335	5,597,862	411,845
1916	32,805,883	6,397,613	880,916

The whole number of spindles in the United States was 33,333,176, or only 527,293 spindles in excess of the number of spindles active in 1915-16. The number of spindles in the principal cotton-manufacturing States was as follows: Massachusetts, 10,896,774; South Carolina, 4,735,193; North Carolina, 3,988,098; Rhode Island, 2,552,765; Georgia, 2,259,855; New Hampshire, 1,455,282; Connecticut, 1,343,573; Alabama, 1,111,860; and Maine, 1,090,006. No other State reached 1,000,000 spindles.

There was a heavy demand in the United States for cotton goods for South America and much of the business once enjoyed by Europe was deflected to American manufacturers. Statistics of shipments of cotton goods to South America for the 10 months ending October, 1916, as summarized in the *Textile World Journal*, indicate the wonderful increase in business that had taken place. During this period, Brazil took 2,343,303 yards, compared with 414,972 yards in 1915, and 374,329 yards in 1914; Chile, 17,316,240 yards, as against 6,709,311 yards in 1915, and 8,155,994 yards in 1914; Colombia, 35,510,072 yards, compared with 17,567,640 yards in the same period the previous year, and 9,461,643 yards in 1914; "other South America," 36,431,033 yards, compared with 18,758,420 yards in 1915, and 12,139,575 yards in 1914. Argentina took, in this period, 24,778,853 yards valued at \$2,602,418.

But American manufacturers did not have it all their own way, for Great Britain, notwithstanding the war, was making every effort to retain her immense export trade in cottons. British exports of cotton cloth to South and Central America in the 11 months ending with November, 1916, amounted to 475,000,000 yards, against 275,000,000 yards in the same months in 1915, 276,000,000 in the corresponding months of 1914, and 549,000,000 in the same months of 1913. To Argentina alone the exports of cotton piece goods for the 10 months ending with October, 1916, were 172,000,000 yards, against 95,000,000 yards for the same months of 1915, 81,000,000 yards in 1914, and 174,000,000 in 1913, the high record year of Argentine imports. Exports of cotton cloths from the United States to Argentina in the 10 months ending with October, 1916, were but 25,000,000 yards, as against British exports to Argentina of 172,

000,000 yards in the same period. To South and Central America, as a whole, American exports of cotton cloths in the 11 months ending with November were about 180,000,000 yards, against British exports of 475,000,000 yards to the same territory in the same period, the 11 months ending with November, 1916.

The statistics of exports from the United States during the 10 months ending with October, 1916, afforded a reliable, if incomplete, index of the progress made during the year by the cotton industry. "Unbleached cloths" declined in this period from 180,557,032 yards in 1915 to 124,066,132 yards in 1916, although the latter figures showed a gain over the 10 months' exports in 1914, which amounted to only 109,856,507 yards. The steady increase in bleached goods trade was shown by the total of 71,097,787 yards for the first 10 months of 1916, as compared with 58,729,130 yards in 1915. The most notable gain of all was a total of 123,778,601 yards of printed cloths shipped in the first 10 months of 1916, compared with 75,243,877 yards in 1915, and of 144,263,248 yards for the 10-month period in 1916 of "all other colored cloths," largely composed of yarn dyed goods (coverts, cottonades, and suitings going to South America), as against 82,581,798 yards in 1915. The gain in "dyed in the piece" cloths amounted to less than 2,000,000 yards. Knit goods and yarn shipments during the 10-month period in 1916 were given only in value, and were, therefore, rather misleading. The figure for the 10 months of 1916 was \$19,413,939, compared with \$13,533,007 in 1915. Cotton yarns, valued at \$4,892,752, were shipped up to and including October in 1916, as against \$2,825,288 in 1915.

During the year wool manufactures showed great strength and in some cases there were cancellations by the agents of the mills rather than by buyers, as in previous years. The dye situation improved materially and the war contracts did not figure as much as in 1915, for British manufacturers were showing themselves competent to take care of the clothing, not only of their own vast armies, but to a large measure of those of their allies.

TEXTILE MILL CONSTRUCTION IN 1916. The total number of new textile mills in the United States for the year 1916 was placed at 280, by the *Textile World Journal* in its annual review, which affords the authority for the accompanying paragraphs. This figure can be compared with 219 for 1915, and an annual average of 255 for the eight preceding years. The highest record for this period was 289 new mills established in 1909, and the low mark 208 new mills in 1911. The cotton and silk industries in 1916 showed a large increase over 1915, silk in particular making the largest gain, while the wool and knitting establishments made smaller relative increases, and miscellaneous mills showed a loss. The accompanying table gives a comparison of new mills constructed during 10 years.

A marked tendency toward expansion in the cotton industry was noted, for 51 new mills were established by newly organized concerns or as separate departments of old-established mills. Not only was this more than double the number in 1915, but above the average for the eight preceding years. The principal reason for cotton mill expansion was the continuously in-

COMPARISON OF NEW MILL CONSTRUCTION FOR THE TEN YEARS 1907-16

	1916	1915	1914	1913	1912	1911	1910	1909	1908	1907
Cotton .....	51	24	26	27	37	32	67	80	47	64
Wool .....	23	19	21	24	24	20	81	47	28	25
Knitting .....	113	111	110	142	122	92	113	105	94	83
Silk .....	60	25	51	54	46	38	34	37	33	51
Miscellaneous .....	33	40	37	30	36	26	29	20	25	39
Totals .....	280	219	245	277	265	208	274	289	222	262

creasing demand for tire fabric yarns and cloths. More new mills, particularly in the East, were organized to make this class of product than any other grade of cotton goods. In fact it was stated that new machinery started during 1916 or ready in the following year to be put in operation on tire fabric products would have a larger output than the entire production of tire fabric materials a few years previous.

As usual, North Carolina leads the South in number of new cotton mills, and in 1916 also exceeded South Carolina in total number of new spindles. Tennessee and Georgia made a large gain over increases in recent years.

In addition to new construction an equally important fact was that many New England mills had also reorganized and extended various departments. Such reorganizations and extensions of departments of old-established mills indicated in many ways the growth of the cotton industry quite as much as did the new mills organized, for many of these extensions were of imposing magnitude and of more importance than new mills.

Twenty-three woolen and worsted mills were established during the year, but nearly all the new enterprises were of small or medium size, and were scattered throughout the various manufacturing sections already occupied by these industries. Massachusetts led in number, followed by Pennsylvania, Connecticut, and Rhode Island. The extensions made by old-established mills represented a larger addition to the manufacturing facilities of these industries than the new projects, and especially notable in 1916 were the enlargements made by the carpet and rug mills. It was an interesting circumstance of the year that the woolen and worsted mills more than any other division of the industry seemed to view the existing commercial situation and the possible return of peace in a conservative spirit and were disposed to make only such additions and replacements as were absolutely necessary.

In the knitting industry a total of 113 new enterprises were started, and this number it was stated, would have been greater were it not for a needle shortage which prevented many projects from maturing. The largest number of new plants were in Pennsylvania, while North Carolina was in second place. The South was showing greater interest each year in the knitting industry, and besides those in North Carolina, knitting mills were established in Alabama, Georgia, South Carolina, Tennessee, Texas, and Virginia. Many of these new hosiery and underwear mills in the South were large enterprises representing investments of \$50,000 to \$200,000. As regards product, hosiery mills predominated in the new mills of the year, and there were approximately as many new hosiery mills as new underwear mills and other knit goods mills combined.

Silk mills also increased during the year with

the important developments in that industry which are discussed under SILK (q.v.).

Among the miscellaneous new mills of the year were three artificial silk mill projects, one of which expected to begin the production of fibre silk early in 1917. One of the other new artificial silk mills was a complete new plant at Roanoke, Va., as a branch of the American Viscose Co., of Marcus Hook, Pa., the only plant previously producing artificial silk in the United States.

The other miscellaneous new mills in the textile industry were fibre, cordage, asbestos, and dyeing, bleaching, and finishing plants. Bleacheries and dye works naturally predominated. Fewer raw stock bleaching and cotton nitrating plants were established than during 1915, the supply of nitrated cotton having caught up with the demand.

**THEATRES.** See ARCHITECTURE; DRAMA.

**THEBES.** See ARCHÆOLOGY.

**THEBES, MADAME DE.** A French astrologist and clairvoyant, died at her country residence at Meung-sur-Loire, Dec. 24, 1916. Her real name was Anna Victorine Savigny, but it was by the one she had assumed that she was always known. She was born in 1844 and early became a celebrity in Paris. It was said that Alexandre Dumas placed her on the highroad to fortune by inviting her to read the palms of a company of dinner guests and afterward publishing an enthusiastic account of her powers. From then on, she was sought out by persons in all walks and stations of life and many thousands came to regard her prophecies as if they were inspired. The yearly *Almanach* published by her proclaimed her successes. Her many failures to predict correctly did not seem to disconcert her or her followers, and they were able to point to an extraordinary number of cases where, it was claimed, she had foretold events correctly, such as: the downfall of the Second Empire in France; the Boer War, the Russo-Japanese War, the second Balkan War; the assassination of King Alexander and Queen Draga of Serbia, of President Carnot, and of King Humbert of Italy; the discovery of radium; the capture of Khartum; the deaths of General Boulanger, President Faure, Queen Victoria, Pope Pius X, and Zola; the Messina and San Francisco earthquakes; the Paris floods of 1910; the defeat of President Taft for reelection; and the recent Irish revolt. Several months before the *Titanic* sank, she had warned Col. John Jacob Astor not to travel on the sea during the next year. But Mme. de Thebes gained her greatest celebrity after the fulfillment of her prophecies that in 1914 "France will be drawn into war and will emerge victorious," that the Germans would closely approach Paris, but would be unable to take the city, and that "President Wilson will have a wretchedly delicate rôle; after being very sympathetic, they will fall on him from all sides." The seeress, how-

ever, failed to predict correctly the end of the great war, first announcing that peace would be declared in 1915 and later in 1916. Two of her best known publications were *The Enigma of the Hand* and *The Enigma of the Dream*.

**THEOSOPHICAL SOCIETY, THE.** In 1916 the American section of the Theosophical Society had 4714 members and 154 churches. The total membership of the society was about 30,000. Altogether, since the Theosophical Society was founded in 1875, more than 1400 branches have been established. The national president of the American section is A. P. Warrington and the headquarters are at Krotona, Hollywood, Los Angeles, Cal. The general headquarters of the society were removed in 1879 from New York City to Adyar, Madras, India, and there the president, Mrs. Annie Besant, resides. There are branches of the society in all parts of the world.

**THIBAUD, JACQUES.** See **MUSIC, Artists, Instrumentalists.**

**THIEME, H. P.** See **PHILOLOGY, MODERN, French.**

**THOMAS, ALBERT.** See **FRANCE, History.**

**THOMAS, AUGUSTUS.** See **DRAMA.**

**THOMAS, EDITH.** See **LITERATURE, ENGLISH AND AMERICAN, Poetry, American.**

**THOMSON, ELIHU.** A distinguished American scientist, inventor of electric welding and holder of more than 500 patents, who in December, 1916, was awarded both the Royal medal of the Royal Society, London, and the John Fritz medal (United States).

**THOMPSON, SILVANUS PHILLIPS.** A British electrical engineer and physicist, died in London June 13, 1916. He was born in York in 1851, graduated from London University in 1869, and later took degrees at the Royal School of Mines. From 1878 to 1885 he held the chair of experimental physics at University College, Bristol, and thereafter was principal and professor of physics in the City and Guilds Technical College, Finsbury, London. He also discharged the duties of professor of applied physics in London University. Professor Thompson became especially well known for his contributions to dynamo-electric machinery and the electro-magnet. At various times he was president of the Physical Society, the Institution of Electrical Engineers, the Optical Society, the Illuminating Engineering Society, and the Optical Conference. He was elected a fellow of the Royal Society, and received honorary degrees of M.D. and LL.D. In 1893 he visited the United States. He published, besides the two important treatises, *Dynamo-Electric Machinery* and *Elementary Lessons in Electricity and Magnetism*, and other technical works, *Michael Faraday* (1898), and *Life of Lord Kelvin* (1910).

**THORNDIKE, ASHLEY H.** See **LITERATURE, ENGLISH AND AMERICAN, Essays, etc., American.**

**THROMBOPLASTIN-HESS.** See **KEPHALIN.**

**THURSTON, JOHN MELLEN.** An American lawyer, Republican leader, and legislator, died at Omaha, Neb., Aug. 9, 1916. Although born (1847) in the East, at Montpelier, Vt., he went West early, studying for a time at Wayland University, Beaver Dam, Wis., and gaining admission to the bar in 1869. Thereafter he was identified with the life of Omaha, where he settled to practice. By 1874 he had become city attorney and by 1875 a member of the State

Legislature. Two years later he was appointed to the legal staff of the Union Pacific Railroad, of which in 1888 he became general counsel. For many years Mr. Thurston was prominent in Republican national politics, as temporary chairman of the national convention of 1884, as permanent chairman of the conventions of 1888 and 1896, and as United States Senator from 1895 to 1901.

**THYROIDITIS, PARASITIC.** See **TROPICAL DISEASES.**

**TIBET.** A Chinese dependency in central Asia; the home of Buddhism. The estimated area is 756,000 square miles, including Koko-Nor and Tsaidam. There are widely varying estimates of population; perhaps 2,000,000 is as plausible as any. The capital is Lhasa, with an estimated population of 15,000 to 20,000, including a large number of Buddhist monks. Tibet imports from India cotton and woolen goods and grain, in exchange for borax, salt, and musk; wool and ponies are important exports. Gold is said to exist in workable quantities.

**TICKS.** See **ROCKY MOUNTAIN SPOTTED FEVER; VETERINARY MEDICINE.**

**TIMBER.** See **FORESTRY.**

**TIME, STANDARD.** See **DAYLIGHT SAVING.**

**TIMOR.** The largest island of the Lesser Sunda group, divided between Portugal and the Netherlands. The estimated area is 12,593 square miles, of which 7330 belong to Portugal; population, 400,000, of whom 200,000 are Portuguese subjects.

**TIN.** The production of tin throughout the world showed a decline in 1916, and both the Federated Malay states and the Straits Settlements, which are the leading sources of this metal, manifested a striking decrease in their exports from 1915. There was an increase in the costs of production, and an increase in prices which reached a maximum monthly average of 51.23 cents in New York in April. The average price for the year was 43.48 cents, as compared with 38.59 in 1915 and 34.30 in 1914. There was a tendency for stocks to increase and for consumption to decline. The difficulties and high rates of freight and legislation and hostile interference with shipping all acted to develop uncertainty in the tin markets. In the United States the tin industry naturally was hampered by the prevailing scarcity of steel, although it was fairly active during the year. There were not, however, any great enlargements of the capacities of existing plants. The United States Geological Survey reported the production of tin in the United States in 1915 as 204,000 pounds, valued at \$78,846, as compared with 208,000 pounds, valued at \$66,560 in 1914.

It is worthy of note that the tin market in 1916 was completely under the control of the British government and when early in March exports were checked the price increased at once. The disturbance of regular traffic of course also affected the industry. See **CHEMISTRY, INDUSTRIAL; METALLURGY.**

**TIBOL.** A crownland of Austria. The area is 10,302 square miles; population in 1910, 946,613.

**TIRPITZ, ALFRED VON.** See **GERMANY, History, Peace Discussion.**

**TIRYNS.** See **ARCHEOLOGY.**

**TISZA, COUNT STEPHAN.** See **AUSTRIA-HUNGARY, History.**



**TOBACCO.** The tobacco crop of the United States in 1916 was the largest ever produced—1,150,622,000 pounds, and was grown on the largest acreage ever employed for this crop—1,411,800 acres. The yield per acre was not exceptionally large and was not quite equal to the five-year average, but the quality was good and the farm price relatively high, giving the crop a value at the farm of \$169,008,000. The year was a prosperous one for the tobacco industry in the United States, as indicated by the manufacturer of products. The report of the Commissioner of Internal Revenue for the fiscal year showed the production of large cigars to be 7,390,183,170, an increase of more than 330,000,000 over the preceding year. There was a decrease amounting to nearly 25,000,000 in the number of little cigars, but an increase of more than 4,000,000,000 in the cigarette output, which reached 21,066,196,672. Manufactured tobacco (chewing and smoking) reached an aggregate of 417,235,928 pounds, an increase of nearly 15,000,000 pounds; and the output of snuff was 33,170,680 pounds, an increase of three and one-third million pounds.

The cigar, cigarette, and manufactured tobacco interests paid revenue taxes aggregating \$88,063,947, which represented an increase of more than \$8,000,000 over the previous year. The tax on cigarettes alone was over \$26,000,000. Imports of foreign wrapper leaf in the fiscal year amounted to slightly over 5,000,000 pounds, nearly all from the Netherlands, and hence classed as Sumatra. Of filler leaf there were imported 42,943,027 pounds. The export of tobacco was considerably interfered with by the war and by the restrictions placed on importation of tobacco products by several of the countries at war.

With a view to improvement in the methods of production and the quality of tobacco in the Philippines and to raise its standing in the markets of the United States, the Legislature passed a law providing for an official inspection of all tobacco designed for export. The law related also to the use of improved seed, curing in sheds of approved design, efforts to find means for combating diseases and pests affecting tobacco, and inspection and certification of the products in the islands and in the United States.

**TOBACCO POISONING.** See **SNUFF POISONING.**

**TOBAGO.** See **TRINIDAD AND TOBAGO.**

**TOGO.** A German protectorate on the Guinea Coast of Africa between Dahomey (French) and the Gold Coast (British). Estimated area, 87,200 square kilometers (33,668 square miles). Estimated native population, 1,032,000. The number of whites, Jan. 1, 1913, was 368, of whom Germans 320. The forests contain oil-palms, rubber trees, and dyewoods. To some extent the natives cultivate corn, yams, manioc, bananas, and ginger. In 1912 and 1913 imports were valued at 11,428,000 and 10,631,000 marks; exports, 9,959,000 and 9,138,000. Imports from Germany in 1912 amounted to 4,820,000 marks; exports to Germany, 5,808,000. Exports of merchandise in 1913 included: palm kernels, 2,558,000 marks; raw cotton, 532,000; palm oil, 518,000; rubber, 360,000; cattle, 334,000; cacao, 333,000; corn, 288,000; ivory, 56,000. Railway in operation at the end of 1913, 327 kilometers (203 miles). The budget for 1914-15 was continued for 1915-16, balancing at 4,177,943 marks, the

estimated receipts being almost wholly local. Lome is the capital and chief port.

The conquest of Togo was effected by the Anglo-French forces Aug. 25, 1914. The country is in part administered by the government of the Gold Coast and in part by that of Dahomey. See **GERMAN PROTECTORATES.**

**TOLSTOI, COUNT LEO.** See **RUSSIAN LITERATURE.**

**TONGA, or THE FRIENDLY ISLANDS.** A group of islands in the south Pacific, constituting a British protectorate. Area, 390 square miles. As estimated in 1910 the population was 21,695, including about 600 whites; at the end of 1912, natives numbered 22,527. Nukualofa, on Tongatabu, is the capital.

**TONGKING.** A state (the northernmost) of the colony of French Indo-China (q.v.), lying between China and Annam. The trade is included with that of French Indo-China. Hanof is the capital, as well as the capital of French Indo-China.

**TORPEDO BOAT DESTROYERS.** See **BATTLESHIPS AND OTHER WAR VESSELS; NAVAL PROGRESS.**

**TORPEDOES.** See **SUBMARINES.**

**TOSTI, SIR FRANCESCO PAOLO.** An Italian composer and song writer, who long lived in England, died in Rome Dec. 3, 1916. He was born in 1847 at Ortona in the Abruzzi. He studied violin and composition at the Naples Conservatory, where he was appointed a pupil-teacher. After many hardships, he gained his first success with two songs which he himself put out in Rome when publishers had rejected them. Then, through the interest of Sgambati, he became music master to Princess Margherita of Savoy, later Queen of Italy, and keeper of the Musical Archives of the Italian Court. Believing that he would find a highly appreciative public in England, he visited that country in 1875. Publishers refused his song "For Ever and Ever," but the public acclaimed it, and other songs, such as "That Day," "Aprile," "Good-bye," "The Venetian Song," and "Beauty's Eyes." Some of these have been translated into as many as 11 languages. Tosti was appointed music master to the English royal family in 1880. King Edward created him C. V. O. in 1906 and K.C.V.O. in 1908.

**TOTEN AUGEN, DIE.** See **MUSIC, Germany.**

**TOWN PLANNING.** See **CITY PLANNING.**

**TOWNSEND, CHARLES ELROY.** Re-elected Republican United States Senator from Michigan Nov. 7, 1916.

**TOWNSEND, JOHN G.** Elected Republican Governor of Delaware Nov. 7, 1916.

**TOZER, HENRY FANSHAW.** An English philologist and geographer, died June 2, 1916. He was born at Plymouth in 1829 and was educated at Winchester and at University and Exeter colleges, Oxford. He became fellow of Exeter, tutor, and classical moderator, and was curator of the Taylor Institute from 1869 to 1893. He took orders, but devoted himself largely to extensive travels in Greece and Turkey and to scholarly pursuits. Besides editing various works on Greece, he published: *The Highlands of Turkey; Lectures on the Geography of Greece; The Church and the Eastern Empire; History of Ancient Geography*, and similar works; also, an English commentary and prose translation of Dante's *Divina Commedia*.

**TRACK AND FIELD ATHLETICS.** See ATHLETICS, TRACK AND FIELD.

**TRADE UNIONS.** The year was relatively uneventful in trade union history. In the United States the most important events were connected with STRIKES AND LOCKOUTS (q.v.), ARBITRATION AND CONCILIATION (q.v.), and the AMERICAN FEDERATION OF LABOR (q.v.). Consult also cross references under LABOR. The INDUSTRIAL WORKERS OF THE WORLD (q.v.) were conspicuous at times, but their propaganda gained little headway. In England, as in America, the excessive unrest of 1915 due to the disruption of trade relations by war-time conditions had been temporarily allayed by new working agreements. Nevertheless there were both at home and abroad evidences that employers were far from ready to cease their struggle against union demands. The National Conference Board formed in America thus constituted a new challenge to labor. While abroad the industrial war was temporarily overshadowed by the great international struggle, nevertheless there were repeated evidences of the intention of unions, especially in Great Britain, not only to prevent the wiping out of their gains by war conditions but even to increase them. The Allied Labor Conference, while indicating a degree of international trade union sentiment, did not apparently produce an acceptable programme of international action.

**NATIONAL CONFERENCE BOARD.** A very important development in the relations of trade unions to business was the formation of the National Industrial Conference Board in November, comprising over 15,000 employers with a combined capital of \$8,000,000,000 and a total labor force of 7,000,000 wage earners, or nearly three-fourths of all industrial workers in the country. This board will serve as a clearing house of information and seek to enlist the support of the public and the government by publicity and education. The manager, M. W. Alexander, said that henceforth "there will be nothing concealed or suppressed, and there will be no presentation of arguments except in the full light of day or for the benefit of the whole people." The manager's statement declared that the co-operation of labor was necessary and would be cultivated by every possible means. The organization hoped "to develop among the employees a reasonable attitude towards manufacture and other industry, to inspire a sense of fair play, efficiency, and loyalty." The press took the attitude that this Board was "a union formed by employers against labor"; and quoted a statement of William H. Burr, its president, to the effect that "labor organizers are truculent and aggressive. Organized labor is never satisfied, and it is eternally bent on wrecking that structure of industry which has been erected through the patience, persistence, and patriotism of business men." In response to this organization on November 19th at a meeting in Washington there was formed a defensive alliance of the American Federation of Labor with the railway brotherhoods. This was expected to lead to a more complete consolidation of trade union forces throughout the country.

**THE STRIKE AND ANTI-TRUST LEGISLATION.** An important legal suit was that of Dowd vs. United Mine Workers, in which damages of \$1,250,000 were sought under the Sherman Anti-

Trust Law on account of an alleged conspiracy to restrain interstate commerce by a strike. Mr. Dowd was receiver of a coal mine in western Arkansas which in 1914 became involved in a contest with the mine workers. One of the mines was almost completely destroyed. In the suit the demurrer of the workers was upheld in the Federal district court; but its decision was reversed by the circuit court of appeals about November 1st. The opinion held that interference with interstate commerce constituted a proper cause for action. The case was then appealed to the Federal Supreme Court. This case was similar to that of Loewe vs. the Danbury Hatters, although no boycott was here involved. The important aspect of this case was that it involved the utilization of the strike as a means of conspiring to restrain interstate commerce. It consequently involved the most vital weapon of organized labor. The case antedated the Clayton Act, but the decision of the highest court was expected to throw some light on the bearing of this act upon trade union activities.

**ALLIED LABOR CONFERENCE.** This was a conference arranged by the French Confederation of Labor. It was held at Leeds, England, July 5th in private sessions under the presidency of James O'Grady, a Labor member of the British Parliament. In a statement issued to the press it was said that the conference had taken steps to neutralize the International Trade-Union Office, by removing it from Berlin to Geneva. A proposal of the American Federation of Labor (q.v.) for a world's trade union congress at the same time as the peace conference at the close of the war was voted down, ostensibly for the reason that this might tend to make organized labor an object of ridicule on account of its pretentiousness. The proposal, however, had received the support of the French delegates. A resolution presented by these same delegates declaring freedom of the seas to be one of the necessary accomplishments of the war was withdrawn after the British members had violently opposed it on the ground that they could not support any proposal which might tend to jeopardize England's food supply.

**GREAT BRITAIN.** Many grave problems of intimate importance for the success of the nation in war and for the protection of labor confronted organized labor in England during 1916. There had been much complaint regarding the apparently indifferent attitude of British labor toward the immense problems of production necessitated by the war. (See under LABOR.) The unionists had openly protested against efforts to undermine their trade prestige in various lines, and had frequently resorted to strikes early in the war to enforce the improvement of labor conditions which the pressure and confusion of war-time activity had seriously demoralized. Nevertheless, the Trades-Union Congress with 650 delegates in its annual session at Bristol in September pledged its members to assist the government as far as possible in winning the war. In commending this, Mr. Lloyd George, then Munitions Minister, said to the congress: "The government can lose the war without you; they cannot win it without you. The war has resolved itself into a conflict between the mechanics of Germany and Austria on the one hand and the mechanics of Great Britain and France on the other." In view of

this declaration of the unions, and the findings of "The Health of Munitions Workers Committee" showing the deplorable conditions in most munitions plants and the general nervous tension, it would seem that few of the labor disturbances were due to anything like an unpatriotic attitude on the part of the unions. It should be recalled in this connection that trade-union regulations had been suspended for the period of the war and that in the industries contributory to the war the right to strike no longer existed.

The official report of the registrar of friendly societies in that part dealing with trade unions showed that on Dec. 31, 1914, there were 690 unions in Great Britain. Of these 643 made returns indicating 3,261,050 members and \$34,128,000 funds. The average contributions per member per week was 13.2 cents. The following benefits were paid during the year: unemployment, \$4,331,000, including \$827,000 for unemployment insurance in the insured trades; disputes, \$3,260,000; sickness and accident, \$3,309,000; funeral, \$778,640; miscellaneous, \$2,627,000.

**HOLLAND.** From reports of foreign labor departments reviewed in the *Monthly Review* of the United States Bureau of Labor Statistics (September, 1916), it appears that the number of trade unions in Holland Jan. 1, 1915, was 3373 with 227,391 members. This was an increase of 150 in number of unions and of 7114 in membership during the preceding year. Unions organized on a religious basis had increased 10.5 per cent in membership and others less than 1 per cent. Two-thirds of the unions and members were affiliated with one of five national federations. There were outside of the unions 634 workingmen's associations with 75,721 members. Of the trade union members, 15,982 were in Protestant unions, 41,809 in Catholic unions, and the remainder (169,600) in non-sectarian unions.

**NEW SOUTH WALES.** The same source shows that New South Wales unions in 1914 numbered 205 with 237,714 members. The largest memberships were in the following groups: building, 22,685; engineering and metal working, 19,243; food, drink, and narcotics, 18,244; mining and smelting, 26,857; pastoral, 22,941; railroads and street railways, 47,018; navigation and shipping, 19,933. The aggregate assets of the unions were \$892,998. The membership of friendly societies was 182,325 with \$8,686,000 assets. State subsidies to these societies amounted to \$113,500; while the following benefits were paid by them: sick pay, \$840,912; funeral donations, \$216,296; medical attendance and medicines, \$887,202; or a total of \$1,944,410.

**AUSTRALIA.** The number of trade unions in the Commonwealth increased from 302 with 147,000 members in 1906 to 713 with 528,000 members in 1915. Railway and tram workers comprised the largest single union.

**CANADA.** The report of the Canadian Department of Labor for the calendar year 1915 showed that the war was demoralizing trade union organizations. In 1914 there was a decline of 9636 in union membership and of 14 in number of local unions. In 1915 there was a further decrease of 120 local unions and 22,800 members; the total membership at the close of 1915 was 143,343. The causes of this decline were

the enlistments (about 12,500), the employment of other thousands in British munitions plants, and the depression in certain industries. Of Canadian unionists 114,722 were affiliated with international organizations, a decrease of 25,760 in one year. Trade union benefits were paid to the amount of \$14,525,000, or \$1,727,000 less than in 1914. Death benefits aggregated \$7,628,000 and strike benefits, \$3,208,000.

**TRADING STAMPS.** See TAXATION.

**TRAINING CAMPS.** See UNITED STATES, Army.

**TRAMMELL, PARK.** Elected Democratic United States Senator from Florida, Nov. 7, 1916.

**TRANSMISSION OF ELECTRIC POWER.** See ELECTRIC POWER, TRANSMISSION OF.

**TRANSVAAL.** One of the four original provinces of the Union of South Africa (q.v.). Pretoria, the capital of the Union, is also the seat of the provincial government.

**TRANSYLVANIA.** Part of eastern Hungary, formerly a grand principality. It is bounded on the east by the Bukowina and Rumania and on the south by Rumania. It is sometimes not regarded as a part of Hungary proper, as so much of its population is non-Magyar, especially Rumanian. The area is 22,318 square miles. The census of Dec. 31, 1910, returned a population of 2,678,367, as compared with 2,476,998 in 1900 and 2,267,935 in 1890, the increase per cent being 9.2 between 1890 and 1900 and 8.1 between 1900 and 1910. In the latter year Rumanian was the mother tongue of 1,472,021 (55.0 per cent) of the inhabitants; Hungarian, 918,217 (34.3 per cent); German, 234,085 (8.7 per cent). Adherents of the Orthodox, or Eastern, Church constituted 29.6 per cent of the population in 1910; Greek Catholics, 28.0 per cent; Reformed, 14.9 per cent; Roman Catholics, 14.0 per cent; Evangelicals of the Augsburg Confession, 8.6 per cent; Unitarians, 2.5 per cent; Jews, 2.4 per cent. Of the inhabitants over six years of age in 1910, 50.5 per cent could read and write, as compared with 41.5 in 1900. The principal towns include Kolozsvár (Klausenburg), regarded, after Budapest, as the most important intellectual centre in Hungary, with 60,808 inhabitants in 1910; Brassó (Kronstadt), 41,056; Nagyszében (Hermannstadt), 33,489; Maros-Vásárhely, 25,517.

**TRAVEL, BOOKS OF.** See LITERATURE, ENGLISH AND AMERICAN.

**TREE, SIR HERBERT BEEBOHM.** See DRAMA.

**TRENCHES AND TRENCH FIGHTING.** See MILITARY PROGRESS.

**TREPOFF, ALEXANDER.** A Russian statesman, succeeded M. Boris Stürmer as Premier in November, 1916. The change of ministry was hailed as a blow at reactionary and German influences.

**TREVENA, JOHN.** See LITERATURE, ENGLISH AND AMERICAN, Fiction, English.

**TRICHINOSIS.** The diagnosis of this disease, often very difficult, has been rendered easier by the discovery of W. Lintz, of the Long Island College Hospital, that the parasite *Trichina spiralis* may be obtained in the cerebrospinal fluid by means of lumbar puncture, not only with a fair degree of constancy, but sometimes before the parasite can be demonstrated in the muscles. Lintz adds three recent cases to those already reported, all in Italians, who

ate infected pork, 21 days prior to lumbar puncture, and all of whom subsequently developed into typical cases of trichinosis, showing all the symptoms of the disease, including the phenomenon of eosinophilia. The spinal fluids were otherwise normal in appearance and chemical reaction, but when centrifuged showed one to four trichinæ in each microscopic field. The embryos were motile and retained their activity for three days when kept in cerebrospinal fluid at the room temperature. W. T. Cummins and G. R. Carson of San Francisco also reported one case, that of a Greek laborer, with the trichina embryos in the spinal fluid.

It is well known that the treatment of this disease is very unsatisfactory. It was thought that salvarsan and neo-salvarsan might prove specific, and they were tried without, however, giving very promising results. In this connection McNerthey reports one cure by means of the intravenous injection of neo-salvarsan, an advanced case in the 15th week of the disease, presenting emaciation, anemia, and extreme prostration, with every sign pointing to a fatal termination. The author, ignorant of the unfavorable reports by Cott and others, injected neo-salvarsan, with the result that within 48 hours there was a remission of symptoms, followed by entire recovery in a few weeks.

**TRIESTE.** A crownland of Austria, forming part of the administrative district of Küstentland and consisting principally of the important seaport of Trieste. The area of the crownland is 37 square miles; the population in 1910 was 229,510.

**TRINIDAD AND TOBAGO.** A British colony composed of two islands—Trinidad, 1754 square miles; and Tobago, 114 square miles. Total population (1911), 333,552, of whom 86,373 were East Indians. East Indian immigration is conducted under the control of the government. The capital is Port of Spain (59,658 inhabitants).

**TRINITY COLLEGE.** A non-sectarian institution for the education of men at Hartford, Conn. It was founded in 1823 by members of the Protestant Episcopal Church as Washington College. The name was changed in 1845. In the fall of 1916 there were 246 students enrolled and the faculty numbered 24. The productive funds of the institution amounted to \$1,300,000 and the income to \$60,000. The library contains 80,000 volumes and 40,000 pamphlets. The president of the college is Flavel Sweeten Luther.

**TRIPOLI.** See LIBYA.

**TROPICAL DISEASES.** A disease peculiar to the gold coast in Africa and known as "bungpagga" has been found by Patton to be apparently due to a vegetable micro-organism, belonging to the order of saccharomyces or yeast fungi. Patton is of the opinion that the yeast cells are absorbed in the intestine and are derived from grain which has become infected in the bin. The definite incubation period appears to be three days, during which there is malaria, headache, a sense of fatigue, anorexia, intense thirst, and constipation. The onset is sudden and rigors may usher in the attack. The temperature rises rapidly to 103° F. or more. There is extreme tenderness in the muscles, within which painful tumors make their appearance in 12 hours; the abscesses

seem always to occur near their bony attachments. There may be only one nodule, or many. In some cases the distribution is bilaterally symmetrical. The tumors are deep seated; they are hard, nonfluctuating, very tender, with their long axes either in or parallel to the long axes of the muscles affected. Each tumor is about the size of a hen's egg. They are at first hard and firm and are easily visible and palpable; later on, if the patient survives they become slightly soft, but never flabby. Usually, in mild cases, the abscesses point after some weeks, and burst if unopened. As a rule, the fewer the nodules the better the prognosis. If the patient survives the acute stage he stands a good chance of recovery. The deaths usually occur within the first week, the third and sixth days seeming to be the most critical. Even during convalescence (for two months or more) the patient exhibits an occasional febrile reaction.

**CHAGAS'S BRAZILIAN TRYPANOSOMIASIS.** Novas has studied Chagas's "parasitic thyroiditis," as the latter designated it at first, and gives the results of much experimental work. The parasite has been named the *Schizotrypanum cruzi*. It induces in adults hypertrophy of the thyroid with myxedema, melanoderma and muscular weakness; in children the course is more acute, with fever, swelling of glands and hypertrophy of the thyroid, entailing symptoms of thyroid insufficiency and sometimes of meningeal irritation. In the chronic form there may also be a syndrome with heart or nervous symptoms predominating. Vaccines made from the parasite have not proved effectual. The parasites locate by preference in the skeletal striated muscle, but may invade glandular, adipose, and connective tissue, heart, spleen, etc. Most of the cells of the organism seem to bear invasion by the parasites without much harm, but suffer from their toxins. These seem to affect the thyroid predominantly, but the genital glands and suprarenals are liable to suffer as well as the nervous system from the presence of the parasites in the brain. Their penetration into the heart is responsible for most of the deaths from Chagas's disease. The intermediate host is a bug, called "barber" by the natives, as it bites mostly about the face.

A new School of Tropical Medicine has been founded in Calcutta. The school, which has received an endowment for ten professors, is already built, but will probably not be opened until after the war is ended.

**TROTting.** See RACING.

**TROWARD, THOMAS.** A British philosopher, died in Lower Shiplake, Oxford, May 18, 1916. He was born in 1847 at Belgaum, India. Following an education at Victoria College, Jersey, and further preparation, he entered the Indian Civil Service. After some 30 years, he retired from office, as divisional judge, and went to Britain, where he lectured in London, Edinburgh, and other cities on philosophical subjects connected with Mental Science and New Thought. In these fields he became known as one of the leading thinkers. His ideas, which have been incorporated in several books, were the outgrowth of a fusion of Western systems of thought with Eastern. While in India he had not only become familiar with Oriental law but with Oriental philosophical and religious

views. He published: *Edinburgh Lectures on Mental Science* (1906); *Bible Mystery and Bible Meaning* (1907); *Doré Lectures* (1909); *The Creative Process in the Individual* (1911).

**TROWBRIDGE, JOHN TOWNSEND.** An American story writer and poet, died at Arlington, Mass., Feb. 12, 1916. He was born at Ogden, Monroe County, N. Y., in 1827. He had only a common school education, supplemented by a winter at a classical academy in Lockport, but as a farmer boy he had begun to write verse, and his first lines published appeared when he was 16. He also taught himself French. For a year (1847) Mr. Trowbridge lived in New York City, where he contributed to the *Dollar* and *Knickerbocker* magazines, but afterward he made his home in Boston. In that city he soon became one of the literary figures of the time, contributing to the *Atlantic* and to *Our Young Folks*, of which he was the editor for several years before it was merged with *St. Nicholas*. Beginning to write stories in 1856, he gained his first big success the next year with *Neighbor Jackwood*, a novel of New England life, which was later dramatized and played with success in several cities. Other well-known novels, among some 35, include: *Coupon Bonds*, *Cudjo's Cave*, and *Farnell's Folly*. Several volumes of his verse appeared, and of this a collected edition has been made. His "Darius Green and His Flying Machine" revived in popularity, when, 40 years after it was written, the aeroplane had become an accomplished fact. Among his stories for boys, those in the "Jack Hazard" series, most of which ran serially in *St. Nicholas* before appearing in book form, at once met great popularity, and other stories of adventure had a wide sale. Mr. Townsend's last book, *A Pair of Madcaps*, was published in 1909. Previous to this he had written *My Own Story, With Recollections of Noted Persons* (1903).

**TRUDEAU, EDWARD LIVINGSTON.** See LITERATURE, ENGLISH AND AMERICAN, *History, etc.*, American.

**TRUDEAU FOUNDATION.** See TUBERCULOSIS.

**TRUMAN, BENJAMIN CUMMINGS.** An American journalist, died at Los Angeles July 18, 1916. He was born at Providence, R. I., in 1835, and was early a teacher, a type-setter, proof-reader, and reporter for papers in New York and Philadelphia. After the outbreak of the Civil War, he was sent to the South as war correspondent, and became staff officer and secretary to Andrew Johnson, then military governor of Tennessee. At intervals he went into the field, serving as staff officer in several battles. He was elected the first major of the first Union white regiment in Middle Tennessee. Several famous "beats" were achieved by him. News of the battle of Franklin was published in the *New York Times*, for which Major Truman was writing, two days before it reached the War Department, wires having been cut; and the same paper had an account of the burning of Atlanta, and of the battles of the Spanish Fort and Blakeley before any other in the country. After Lincoln's assassination, Truman became confidential secretary to President Johnson, and later he was special agent of the Treasury and Post Office departments, and paymaster in the army.

After a year as Washington correspondent of the *New York Times* and the *San Francisco Bulletin*, he settled on the Pacific Coast in 1870. For two years he owned the *San Diego Bulletin*, in 1872 became editor of the *Los Angeles Express*, for four years was proprietor of the *Daily and Weekly Star* in the latter city, and later, for 11 years, served as chief of the literary bureau of the Southern Pacific Railroad. Major Truman also at various times owned papers in Philadelphia, Nashville, and San Francisco, and he wrote books on California, on the Civil War, and on his travels.

**TRUSTS.** There were no far-reaching developments in problems relating to trusts during 1916. The Federal Trade Commission constituted in 1915 entered upon various lines of investigation, but prosecutions were not extensive nor their results of first importance.

**FEDERAL TRADE COMMISSION.** The first extensive work undertaken by this commission was the securing of adequate information regarding American businesses. It discovered that scarcely one manufacturer in 10 had a cost accounting system, but determined his selling prices by guess work or rule-of-thumb methods. The commission therefore urged the general installation of adequate methods of cost accounting, and in this met with widespread support. The commission also stimulated the formation of trade associations as media for improving cost accounting methods, for standardization of prices and products, for elimination of unfair practices, and spreading other information. It also sought to interest American business men in foreign trade and to induce Congress to revise the anti-trust laws so as to permit the formation of cooperative selling agencies, as authorized in the Webb Bill. The commission thus manifested a constructive rather than a critically destructive attitude toward business organization and methods.

Among the inquiries carried on by the commission was one into the newsprint paper situation. This investigation was carried on for eight months during which extensive testimony was secured from publishers and jobbers. It appeared that small publishers had suffered most. The refusal of the paper makers to testify before the commission on the ground that they had not had time to study the commission's figures revealing large profits raised the presumption that a combination in restraint of trade existed between American and Canadian manufacturers. In consequence the Department of Justice determined to make an investigation. While the cost of this paper had increased so rapidly as to force various leading newspapers to increase their prices, reports showed that imports, mainly from Canada, for the first 10 months of 1916, were 786,000,000 pounds, an increase of 193,000,000 pounds over 1915 and of 265,000,000 over 1914. Importations of wood-pulp had, however, remained stationary during this period. On the other hand, the exportation of domestic-made newspaper and wood-pulp showed great increases. For the 10 months paper exports were 129,916,000 pounds, an increase of 7,700,000 pounds over 1915 and of 23,300,000 pounds over 1914; while exportation of wood-pulp of United States origin had much more than trebled.

The annual report of the commission in two volumes of 350 and 500 pages covered many

aspects of internal and foreign trade. The report closed with a strong recommendation that Congress approve the formation of collective foreign agencies by American manufacturers and shippers for the purchase and sale of products in foreign markets. The report also dealt with the prospect of competition after the war, holding that foreign manufacturers "may be expected to utilize their highly efficient organizations for the promotion of trade beyond their borders, even foregoing profits, or taking very low profits, till their costs again become normal and they have reestablished their trade." The report dealt largely with the competitive conditions in most of the countries of the world and included numerous tables and statistical data concerning trade conditions everywhere. Among other things it pointed out that a combination of British steamship lines was using its control of the carrying trade to restrict our commerce with South America. This charge was denied by the companies.

**EXPORT TRADE.** In his annual report for 1915 Secretary of Commerce Redfield had recommended modifications of the anti-trust laws which would permit the cooperation of American producers in selling in foreign markets. It was believed that such combination was essential to prosecution of American trade in competitive markets following the cessation of the war. The proposal was favored by President Wilson in his annual message to Congress in 1916 and had previously been embodied in the Webb Bill. In its annual 1916 report the Federal Trade Commission strongly advocated this provision. It pointed out that the trade policy of various countries permits some sort of cooperation in the cultivation of foreign markets. The commission recommended that the kind of cooperative organizations permitted should be equally defined; that they be restricted solely to export trade; that their scope be restricted to commercial as distinct from manufacturing activities; and that all such organizations be required to file complete statements of their officers, stockholders, and by-laws with the commission.

Throughout the year, and especially toward its close, there were various active movements looking toward the effective organization of American manufacturers and traders for export business. The most important of these was the National Industrial Conference Board. This represented 12 of the most important industrial organizations of the country comprising 15,000 employers with 7,000,000 employees. These were the National Founders' Association, National Metal Trades' Association, National Council for Industrial Defense, National Association of Manufacturers, National Erectors' Association, National Association of Cotton Manufacturers, American Cotton Manufacturers' Association, National Association of Wool Manufacturers, Silk Association of America, United Typotheta and Franklin Clubs of America, American Paper and Pulp Association, and the Rubber Club of America. See **TRADE UNIONS.**

Another important organization was the Argentine Mercantile Corporation formed along lines laid down in the Webb Bill. Its capital was \$5,000,000; its directors included representatives of tool, hardware, paper, machine, engineering, and other manufacturing concerns; and its primary purpose was to carry out co-

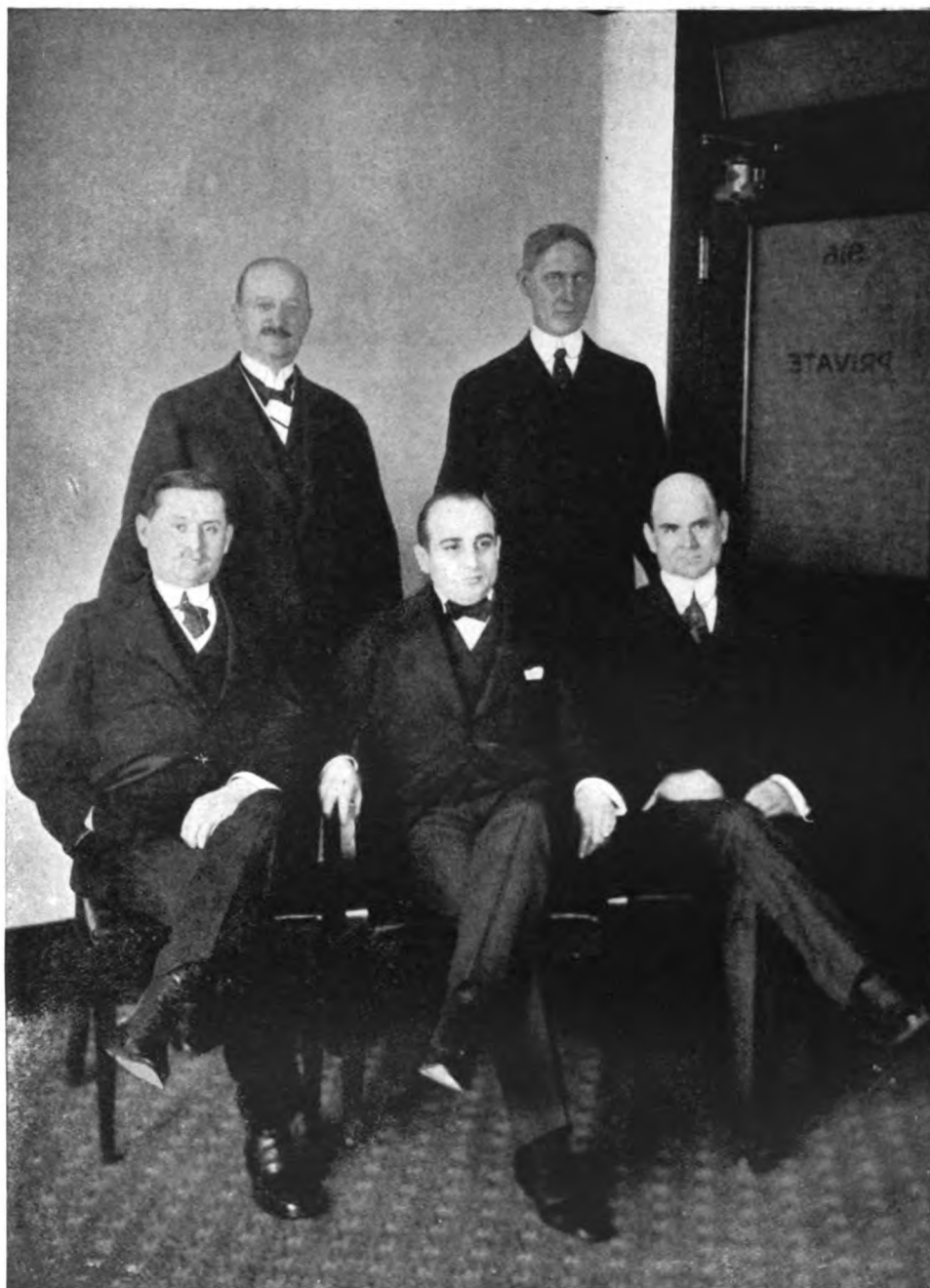
operative plans for exporting goods to South America.

**OIL PIPE LINES.** One of the first reports of the Federal Trade Commission dealt with the pipe lines used in the transportation of petroleum. It covered five main lines running from the oil-producing sections of Kansas, Oklahoma, Texas, and Louisiana. The report was made in obedience to a resolution of the Senate; it was limited to the mid-continent field because another Senate resolution called upon the Interstate Commerce Commission for an investigation of pipe lines, and under an agreement of the two commissions this latter investigation was limited to the interstate pipe lines east of the Mississippi River. The report gave data regarding the capital, earnings, cost of transportation of oil by pipe lines, charges, and regulations of the pipe-line companies, the excess of charges over cost of transportation, and other related matters. It was found that the earnings of companies owning pipe lines average nearly 20 per cent. The commission concluded that the prosperity, or even the existence, of some small oil companies is dependent on reasonable and equitable charges and regulations. It pointed out that "lower pipe-line rates and reasonable pipe-line shipping requirements would enable many small producers and refiners to transport crude oil from the mid-continent field by pipe line who are now unable to do so," and would thus equalize competition throughout the country.

**COBN PRODUCTS REFINING COMPANY.** On June 26th Judge Hand of the United States District Court at New York decreed the dissolution of this corporation which, with others including the National Starch Company, the Novelty Candy Company, and the St. Louis Syrup and Preserving Company, had been indicted for unlawful restraint of trade. The decree found that the combination controlled 60 per cent of the trade in its products; that it had created spurious and sporadic competition as a means of eliminating competitors; and that it had thus shown unwillingness to conduct business in a manner demanded by American law. The court announced that the plan for dissolution must be filed within 120 days; and that this plan (for the first time) must be approved by the Federal State Commission. The case was appealed to the Supreme Court.

**VARIOUS SUITS.** One of the trust suits attracting widest publicity was that in which 11 former directors of the New York, New Haven, and Hartford Railroad were charged with criminal conspiracy to monopolize the transportation facilities of New England. A number of these directors were among the most conspicuous financiers of the country. The trial lasted from Oct. 13, 1915, to Jan. 10, 1916, when the jury acquitted six of the defendants and disagreed as to the remainder. Originally six other directors had been indicted and were to be tried separately, but the government requested the dismissal of their indictments on the ground that they had become connected with the railroad after the commission of the acts for which condemnation was sought. Three other directors had been granted immunity. This suit cost the government about \$200,000, and the defendants about \$575,000.

On February 22nd the Federal District Court at Baltimore pronounced a unique judgment



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Standing, left to right: Will H. Parry and George Rublee. Seated, left to right: Edward N. Hurley, Chairman; Joseph E. Davies, William J. Harris, Vice Chairman

UNITED STATES FEDERAL TRADE COMMISSION, 1916





against the American Can Company. The court refused to order the company's dissolution but retained the indictment filed against it in order to facilitate prosecution in the future if occasion arose. The court declared that the company "had its origin in unlawful acts and thereby acquired a power which may be harmful and the acquisition of which in any event was contrary to the policy of Congress as embodied in the statute," but "it for some time past has used that power on the whole rather for weal than for woe." On April 21st the United States Circuit Court of Appeals at Chicago found that the Quaker Oats Company did not constitute a combination or conspiracy in restraint of trade. In October five members of the Aroostook Potato Shippers' Association were convicted by jury in the United States Court at Boston as maintaining an unlawful restraint of trade. They were charged with blacklisting methods which resulted in secondary boycotting of innocent tradesmen. In January after 10 weeks' trial at Philadelphia the suit of the Bluefields Steamship Company against the United Fruit Company for triple damages amounting to \$15,000,000 was dismissed. This was known as the Banana Trust Suit. About the same time the Supreme Court at Washington dismissed the government suit against 12 prominent transatlantic steamship companies including the Cunard, Canadian Pacific, White Star, and Hamburg-American. This suit was begun on the basis of an agreement by these companies to apportion steerage traffic, and in the lower courts four judges had held certain features of the agreement unlawful. The suit was dropped because the war had completely altered the actual situation. In March was terminated a suit begun three and one-half years previously against the Association of Bill Posters of the United States and Canada, when Judge Landis decided it to constitute an illegal combination. Appeal, however, was taken to the Supreme Court. In Ohio the indictment against Judge Gary of the United States Steel Corporation and various steel companies at Youngstown, Ohio, for violating the State antitrust law by conspiracy to control wages was quashed.

**TRYPANOSOMIASIS.** See TROPICAL DISEASES.

**TUBERCULIN.** Dr. George P. Sanborn, of the Boston City Hospital, gives the results of treatment of tuberculosis of the lymph glands with injections of tuberculin. The preparation was a bacillus emulsion and both human and bovine tuberculin were employed. The initial dosage for children was from 1/50,000 to 1/25,000 of a mg., in adults 1/20,000 to 1/10,000 mg. The results summarized are as follows: In 83 per cent of the cases there was a diminution in the size of the nodes; one or more nodes broke down in 33½ per cent; one or more nodes developed during treatment in 20 per cent; surgical procedures were necessary in 11 per cent; there was a gain in weight in 60 per cent of the cases. There has been a demonstrable improvement in at least 83½ per cent of the patients treated. Recurrence took place in eight cases.

**TUBERCULOSIS.** The search for a test for the existence of tuberculosis in the body which shall be more exact than the various types of tuberculin reactions has been going on for some

years. The chief objection to the tuberculin test is that it fails to differentiate between active and latent infection, so that since the majority of individuals have at one time or another been the subject of tuberculosis, the test after adult life is reached has very little value.

The newer investigations look toward the development of a serum reaction, the so-called complement fixation test, similar to the Wassermann reaction in syphilis. The results so far achieved in this direction have not been entirely satisfactory, the multiplicity of antigens with their varying degrees of sensitiveness being a very disturbing factor. With increasing experience, however, and the employment of a uniform technic, the hope is held out that in the near future a test at least as reliable as the Wassermann reaction may be developed.

Encouraging results were obtained by H. R. Miller, of Columbia University, with an antigen prepared by grinding living or dead tubercle bacilli with dry table salt and then adding distilled water until it is isotonic with the body fluids. The results of 1012 cases tested with this antigen are reported. Special attention is directed to eight incipient cases in which diagnosis by ordinary methods was not practicable, malaria, gastritis, and exophthalmic goiter being suspected. The fixation test was positive in all of them. Of 128 more advanced cases, 90 of which had tubercle bacilli in the sputum, all but four reacted positively to the test. One hundred and fourteen still more advanced cases gave a positive reaction in 109 instances. As showing the value of the test in comparison with the Von Pirquet (tuberculin) test in inactive or arrested cases, 113 of these are reported. Of these, 23 were subjected to the Von Pirquet test, and this was positive in 19 and negative in 4, but the fixation test was negative in all. Miller gives the results in many other types of cases, the particulars of which need not be detailed, but his conclusions are that the reaction with this antigen is practically always positive in active tuberculosis, and negative in non-tuberculous, normal patients, and as a rule in arrested cases.

The August number of the *Journal of Experimental Medicine* was devoted entirely to reports of the Japanese investigators Koga, Otani, and Takano on the subject of chemotherapy in tuberculosis (and leprosy). Various laboratory investigators have attempted to apply chemotherapy to the cure of tuberculosis, since Ehrlich's and Hata's work in syphilis. The treatment of tuberculous animals with a preparation of copper and potassium cyanid showed healing changes in the lesions. Koga's experimental report was supplemented by a clinical report of 63 cases who were, he believed, especially in the first and second stages, greatly improved or apparently cured by the preparation, which he names cyanocuprol. Otani treated 18 cases with generally good results. Takano employed the preparation in six cases of leprosy with apparently beneficial effects. Koga states that the preparation is a double salt of copper and potassium cyanid in 1:2000 dilution. The preparation of the substance appears to be a delicate matter and is not fully revealed.

E. F. McSweeney, who, with Prof. Selakar M. Gunn, was commissioned by the Massachusetts State Board of Labor and Industry and the Industrial Accident Board to investigate the in-

dustrial bearings of tuberculosis, in a preliminary report ("Industry and Tuberculosis," *Journal of Outdoor Life*, April, 1916), says that labor and occupation undoubtedly constitute an important factor in the causation of tuberculosis, but that no particular kind of work can be said to cause the disease. In the records of all the hospitals and sanatoriums examined, women of the home—housewives and domestics—led the list of occupational classes affected by tuberculosis, constituting from 22 to 28 per cent of the total. Clerks, including salespeople, bookkeepers, and stenographers, came next on the list in all sets of records. These two classes—houseworkers and clerks—show the influence of indoor confinement in the production of tuberculosis. Day laborers—workers on streets, roads, railroads, subway excavation, etc.—constituted the third largest class; in their case the favorable influence of outdoor occupation was offset by exposure to dust, long, uncertain hours, night work, temptation to drink, etc. Miscellaneous factory workers, including those employed in making buttons, corsets, and typewriters, but not in the leading industries of the State, came next. The shoeworkers were fifth on the list, furnishing more tuberculosis patients than any other industry in the State. Dust and poisons from blacking, dyes, polishes, etc., were regarded as the unhygienic elements in this industry. Mill operatives—workers in the cotton, hosiery, paper, silk, wool and worsted industries—came next. Teamsters, waiters and waitresses, seamstresses and dressmakers, tailors and tailoresses, stoneworkers, woodworkers, bakers, metalworkers, printers, and jewelers are among the workers whose occupations show unduly high tuberculosis incidence.

The Postgraduate School for the Study of Tuberculosis was formally opened at Saranac Lake, May 17, 1916. The school is a memorial to Dr. Edward Livingston Trudeau, and will be known by his name. The sum of \$500,000 has been subscribed toward its support and the fund is to be known as the Edward Livingston Trudeau Foundation. The school is particularly designed to facilitate the work of physicians who intend to specialize in the study and treatment of tuberculosis. See also VETERINARY MEDICINE.

**TUFTS COLLEGE.** A non-sectarian educational institution, with arts, engineering, and theological departments in Medford, Mass., and medical and dental schools in Boston. The latter two are co-educational. In all departments in the fall of 1916 there were 1737 students and the faculty numbered 279. Benefactions amounting to \$180,919 were received. The college has in productive funds \$1,583,993, and in 1916 had a net available income of \$51,105. In the library were 75,000 bound volumes and 67,000 pamphlets. President, Hermon Carey Bumpus.

**TUITION CHARGES, COLLEGE.** See UNIVERSITIES AND COLLEGES.

**TULANE UNIVERSITY.** A non-sectarian institution for the education of men at New Orleans, La. It was founded in 1834. The student enrollment in the fall of 1916 was 2725 and there were 312 faculty members. The productive funds of the institution amounted to \$4,305,187 and the total income from all sources was \$371,714. The library contained 70,700 volumes. President, Robert Sharp.

**TUNGSTEN.** See CHEMISTRY, INDUSTRIAL; PHYSICS.

**TUNGSTEN LAMPS.** See ELECTRIC LIGHTING.

**TUNIS.** A French north African protectorate lying between Algeria and Tripoli and covering 167,400 square kilometers (64,900 square miles). The population was estimated in 1911 as 1,929,003—1,730,144 indigenous Arabs, Berbers, Moors, etc.; 50,383 Jews, 148,476 Europeans (46,044 French, 88,082 Italians, 11,300 British and Maltese, 696 Greeks, 587 Spaniards, 1767 other). Tunis, with 164,808 inhabitants (69,475 Europeans), is the capital. Agriculture in the low regions and grazing in the fertile mountain valleys are the principal industries. The mining industry has developed in recent years; copper, lead, zinc, phosphates, and iron are mined. The fisheries are valuable. Wool spinning and weaving, with the manufacture of carpets, slippers, saddles, and pottery, are the principal indoor industries. Total imports 1913, 144,254,000 francs; exports, 178,663,000. A French resident-general administers the country.

**TUNNELS.** Tunnel construction in 1916 proceeded in various parts of the world, with but minor changes in methods, and figured in schemes of railway construction and improvement, water supply and irrigation projects, and municipal subways and rapid transit lines. Wherever long bridges were proposed, as across the Hudson River at New York, across the Mississippi at New Orleans, or at San Francisco Bay, engineers were always ready to advance some alternative scheme of tunnel construction, and developments made in the previous quarter century in many cases lent great force to their arguments. In Europe the proposed Channel tunnel came to the fore again with increased government, technical, and popular support, while even at Constantinople it was proposed to tunnel under the Bosphorus.

**TWIN PEAKS TUNNEL.** The Twin Peaks tunnel for San Francisco progressed at a rapid rate during 1916, and was to be completed in May, 1917. Less than one-fourth of the total length of the tunnel, 1200 feet, remained to be excavated at the end of the year, and practically all stations and other accessory construction were finished. Several hundred workmen were employed at both ends in day and night shifts, and the progress of the completed bore was about 12 to 15 feet per day from each end. The concrete gang followed the excavating crew closely, and sides, arch, and invert were completed as fast as the heading advanced. Pneumatic placing machines were used to expedite progress of the concreting. The two ventilating shafts from the tunnel to the surface above were completed, and one of these was used for pumping out the seepage water, which was coming into the tunnel at the rate of 300,000 gallons per day.

**PROPOSED 30-MILE CASCADE MOUNTAIN TUNNEL.** The longest tunnel ever projected was proposed during the year by Gen. H. M. Chittenden, U. S. A., Ret., to pierce the high mountains of the Cascade Range which divides eastern and western Washington. In a notable paper published in *Engineering News*, Nov. 16, 1916, General Chittenden suggested this long tunnel with a summit not much over 1000 feet above sea level to afford a short and easy access to the Puget Sound region and the Northwest. The existing tunnels all had heavy grades and mountainous approaches, and accordingly it was proposed to

build the new tunnel at the point where the Columbia River comes nearest Puget Sound in its southern swing through Washington at the mouth of the Weenatchie River, connecting its valley on the east with that of the Skykomish on the west. Such a double track tunnel would save all the great lines running to the coast vast climbs and the incidental dangers of snow slides and avalanches. The dimensions proposed were width, 30 feet; height at centre, 25.5 feet; height over outer rail, 22.5 feet; net cross-sectional area (after lining), about 650 square feet; gross area in excavation, about 850 square feet. General Chittenden computed that the tunnel could be completed from a single shaft in 13 years at a total cost including interest of \$49,318,000, or from four shafts in 5.5 years at a corresponding cost of \$43,237,000. The possibilities and difficulties of the tunnel were discussed in the paper, and the difficulties do not seem in any way insuperable when considered in the light of the experience of the Rogers Pass tunnel on the Canadian Pacific Railway opened during the year. The proposition, however, was only advanced on the responsibility of its author, and for general consideration without any special idea of immediate construction.

**ROGERS PASS TUNNEL.** The Rogers Pass tunnel under Mount MacDonal in British Columbia was opened for traffic by the Canadian Pacific Railway late in the year. The unusual method of constructing this five-mile tunnel has been discussed in the YEAR BOOKS for 1914 and 1915. The cost of the work was \$6,500,000, and it will save an expensive climb over the mountains.

**ROVE TUNNEL.** Notwithstanding the war, work was being prosecuted vigorously on the Rove tunnel, the world's largest tunnel, and it was put through on May 7, 1916. This tunnel is an important element of the Marseilles-Rhône Canal, an artificial waterway 51 miles in length extending from the Rhône River at Arles to the Bay of Marseilles. The typical section of this canal is 82 feet wide and 10 feet deep, and the tunnel was being constructed to pierce the mountain ridge north of the city and afford direct access to its harbor. The tunnel is  $4\frac{1}{2}$  miles in length and the typical section is a square invert 59 feet wide and 15 feet deep, with an approximately semicircular arch of 41 feet radius, affording an excavated section 79 feet wide and 50 feet high, with a clear area of 3250 square feet. Such a section is unique in that it is about six times as great as an ordinary double track railway tunnel. Furthermore, while the length is not extreme in comparison with other European and American tunnels, yet the yardage of the excavation easily puts it in first place. Thus in comparison with other European tunnels we have the following relative length and excavation:

Name	Length in miles	Excavation in cub. yds.
Rove .....	4.5	2,800,000
Simplon .....	12.3	2,100,000
St. Gothard .....	9.3	1,800,000
Loetschberg .....	9.1	1,000,000

The method of construction is to excavate three arch headings which are opened one into the other so that a central section of rock is left to be removed. There is a masonry lining which is backed on concrete made of a special lime cement. Work was carried on from both

ends mostly through hard rock that requires little if any timbering. The headings were each about 100 feet in cross section and progressed at a rate of about 15 to 18 feet a day. Compressed air locomotives were used in the headings and steam locomotives in the main section and artificial ventilation was employed. The canal and tunnel are comprehensively described in *Le Génie Civil* for May 20, 1916, and in outline in the American engineering press during the year.

**CHANNEL TUNNEL.** This long-debated project, the modern plans of which were discussed in the YEAR BOOK for 1913, continued to be a leading item of interest among engineers and was described fully in *Le Génie Civil* (Paris, October 21st), abstract in *Engineering Record* (New York, November 25th), and in the *Engineering Review* (London). Mr. Asquith, the British Premier, stated that the entire project with the modernized plans would be taken up by the cabinet at an early date, and Arthur Fell, chairman of the committee of members of the House of Commons in favor of the Channel tunnel, was quoted as saying that the plans for construction were so far advanced that work could be commenced immediately whenever the necessary legislation was secured. The estimated cost of the tunnel would amount to about \$70,000,000, and a conservative estimate of the ordinary commercial traffic would show a net return of from 5 to 7 per cent. It would reduce the running time between Paris and London by five and a half hours with the elimination of great expense and delay for transfer of passengers and freight. Furthermore, in view of the war and the friendly relations between England and France the tunnel would have a strategic importance that could not be underestimated and might save a possible food blockade of Great Britain.

**OTHER TUNNELS.** Among engineering projects discussed in Europe during the year in spite of the ravages of war, was a tunnel under the Bosphorus. Detailed plans showing that the work was feasible and would be financially profitable were developed and discussed at Constantinople where the strategic importance was appreciated as elsewhere. Direct communication between European and Asiatic Turkey previously had been discussed especially in view of the construction of the Anatolian and Bagdad Railway, but this had involved bridging the narrows at Rumili Hissar. The Bagdad Railway had involved some of the most notable of modern railway tunnel construction, especially through the Taurus and Amanus mountains. The last tunnel on the Taurus mountain section was blasted through in November, 1916. See under TURKEY.

Several new tunnels for water supply were proposed during the year, the most notable of which was the 18-mile rock tunnel for the new Schoharie supply to the Catskill aqueduct system of New York City. This is discussed under AQUEDUCT. See also RAPID TRANSIT for progress on various municipal subways; BRIDGES; WATER WORKS and WATER PURIFICATION.

**TURBINES.** See STEAM TURBINES; WATER POWER.

**TURKEY.** Formerly a vast empire comprehending extensive possessions in Europe, Asia, and Africa, but greatly reduced by wars with Italy and the Balkan States. Constantinople is the capital.

**AREA AND POPULATION.** Previous to the wars in the Balkans, Turkey in Europe covered 169,-

300 square kilometers (65,367 square miles), carrying a population estimated at 6,132,200. After the first war in the Balkans the treaty of London (May 30, 1913) fixed the northwest boundary of Turkey by a line running through Adrianople vilayet from Enos (Ægean Sea) to Midia (Black Sea); but during the second war Turkey reoccupied the city of Adrianople and with the city recovered more of Adrianople vilayet. This territory was conceded to her by the treaty of Bucharest (Aug. 10, 1913), and, with Constantinople and Chatalja, is all that remains to Turkey of her European domains. Constantinople (city) has, with suburbs, 1,200,000 inhabitants; Adrianople, 123,000.

*Asiatic Turkey.* Turkey in Asia is divided into Asia Minor (501,400 square kilometers, 9,089,200 inhabitants), Armenia and Kurdistan (186,500 and 2,470,900), Syria and Mesopotamia (637,800 and 4,288,600), and Arabia (441,100 and 1,050,000); these divisions are subdivided into vilayets and mutessarifats. Anatolia is another name for Asia Minor. No official census having been taken, the population of the following cities, all in Asiatic Turkey, must be regarded as estimates: Damascus, 250,000; Smyrna, 250,000; Aleppo, 200,000; Beirut, 140,000; Bagdad, 125,000; Erzerum, 120,000; Anium, 95,000; Manissa, 90,000; Jerusalem, 84,000; Aidin, 80,000; Brussa, 80,000; Diarbekr, 80,000; Mosul, 80,000; Sivas, 78,000; Urfa, 72,000; Aintab, 70,000; Mecca, 70,000; Busra, 60,000; Trebizond, 60,000; Adana, 50,000; Homs, 50,000; Hodeida, 49,000; Medina, 49,000; Angora, 38,000.

*Arabia* is the great peninsula of southwestern Asia, lying south of Syria, Mesopotamia, and the Persian Gulf. The estimated area is about 1,200,000 square miles, including the Syrian Desert and the Sinaitic Peninsula; without these, about 1,000,000 square miles. Most of the country is very little known, fully a third of it quite unknown, to the Christian world, while the total number of inhabitants is wholly conjectural. One estimate of the population is 7,500,000, but this figure is generally believed to be much too high. Arabia is mainly a desert country, incapable, except in certain districts, of supporting more than a sparse population. Most of the country, also, has not come under foreign, even Turkish, domination, being governed, so far as there is any government at all, by the tribal leaders. Arabia includes: the Sinaitic Peninsula, which belongs to Egypt; along the Red Sea, Hejaz and Yemen, Turkish vilayets; between these, the mountainous region of Asir, where Turkish dominion is nominal; at the southwest corner, Aden, which is British; to the east, along the southern coast, Hadramaut, Mahra, and Shih; at the southeast, Oman, an independent state under British influence; Hasa, bordering the Persian Gulf northwest of Oman-Hasa, together with Nejd, is nominally a Turkish vilayet; and, in the interior, the Syrian Desert, the desert region of Nufud, Nejd, and, at the south, the great desert territory of Dahna. Among the more important towns are Medina, Mecca, and Jidda, in Hejaz; Hodeida, Sana, and Mocha, in Yemen; Aden, Makalla, in Hadramaut; Muscat, in Oman; and Riad, in Nejd.

*EDUCATION, ETC.* The population is made up of Turks, Greeks, Arabs, Albanians, Bulgarians, Serbians, Vlachs, Kurds, Armenians, Jews, Syrians, Circassians, and other races. Moham-

medans are in the majority. Gregorians predominate in Armenia. There are also Roman Catholics, Jews, Nestorians, etc. Primary education is provided by the Mohammedan priesthood attached to the principal mosques, and consists chiefly in the reading of the Koran. Secular education in the western sense is almost entirely lacking, except in non-Moslem institutions, which meet with no opposition or restraint. Secondary schools are few and special schools almost unknown. The fundamental laws are based upon the Koran. Mohammedan priests are estimated to number about 11,600 and are subject to the sheikh-ul-Islam, who is appointed by the sultan: their priestly office is, however, hereditary. The private ecclesiastical revenues amount to about 20,000,000 piasters per annum. The state pays to the sheikh-ul-Islam 7,031,520 piasters annually, and to the naibs and muftis 7,876,646. The condition of the peasant class is most miserable, the tithe and customs system effectually crippling incentive and breeding chronic poverty, uncertainty, and fear.

*PRODUCTION.* The soil is generally fertile and agriculture by primitive methods is practiced. The farmer, however, makes no attempt to progress, or to produce in quantities beyond his immediate need: the method of levying a government tax in kind upon all produce serves as an effectual check to enterprise, and an additional tax is laid upon all produce exported from one vilayet or subdivision into another. Moreover, the labor problem is acute throughout the empire. No reliable statistics of area under cultivation nor of production exist. The annual output of olive oil has been estimated at about 750,000 quintals, of which 150,000 quintals are exported, 150,000 are consumed by the soap factories, and the remainder by the home markets. The increased cost, however, has led to the substitution of animal fats and other oils. Opium production in 1909-10 was about 10,000 cases, of extra quality.

The world's supply of true Mocha coffee comes from Yemen; it is all grown for export as the Yemen Arab himself never uses it. Cotton is raised. Other products are figs (from Smyrna), raisins, wine, nuts, valonia, canary seed, and linseed. Large areas are under forest. Sheep-raising is practiced, and the fisheries products are valuable. Wool and mohair are exported. The abundant mineral wealth of the empire is undeveloped. Transportation facilities are inadequate, and labor is lacking. Salt is a government monopoly. Coal is mined to some extent; also phosphate of lime, copper, zinc, iron, silver, gold, antimony, etc. The manufactures include silk, carpets and shawls, leather, firearms, brassware, etc. Flour, cotton, and woolen mills produce goods for home consumption and also for export. But manufacturing interests meet with the labor problem, which so far has proved insurmountable for large enterprises.

*COMMERCE.* Figures for the trade of the Ottoman Empire are incomplete and far from reliable. The returns from countries of origin and destination all differ widely when compared with Turkish returns, the Turkish export figures being much too low. As reported for the year ended Feb. 28, 1912, the imports were valued at £143,551,035 and the exports at £123,921,326.

The main articles of import are cottons, sugar, cereals, linen, yarns, woolens, rice, petroleum,

etc.; exports, raw silk and cocoons, raisins, cereals and derivatives, mohair, figs, coffee, opium, skins, valonia, vegetables, minerals, fruits, carpets, etc.

**COMMUNICATIONS.** The length of railway line in European and Asiatic Turkey on Nov. 1, 1914, not including the most recently opened sections of the Bagdad Railway, was as follows: \*Salonica-Monastir, 136 miles; Constantinople-Salonica, 317; Oriental Railways, 593; \*Haidar-Pasha-Angora, \*358; Eski-Shehr-Konia, 283; Mudania-Brusa, 25; \*Smyrna-Cassaba, 165; Alasheir-Afion-Karahissar, 156; Smyrna-Aidin, 320; \*Konia-Eregli-Persian Gulf, 125; Mersina-Adana, 42; Beirut-Damascus, 96; \*Rayak-Aleppo, 295; Damascus-Medina, 812; Jaffa-Jerusalem, 54; Haifa-Deraa, 105. The railways marked \* have a kilometric guarantee. The guarantee paid by the Debt Council amounted to £T528,918 in 1911; £T420,141 in 1912; £T341,388 in 1913; £T238,042 in 1914. In Asiatic Turkey the Turkish government controls 1116 miles, or 31 per cent, of the total railway mileage; German influence extends over 1327 miles, or 36.8 per cent of the total; French over 760 miles, or 21 per cent of the total; Belgian influence over 25 miles, or 0.7 per cent of the total; and British influence over 378 miles, or 10.5 per cent of the total.

The great war in Europe served to increase rather than impede the rate of construction of the Bagdad Railway, especially east of the Euphrates. By February, 1915, the line had reached Tel-el-Abiad, 37 miles east of the river, and by July 23, it was ready for traffic as far as Ras-el-Ain, some 80 miles beyond. Then construction was carried further about 65 miles to Nisibin. Trains during 1916 were able to go to this point and beyond. Here there was a long gap to Jibbara on the Tigris. On the Taurus section, where the line pierces the Taurus range from Karapunar to Dorak, a series of some 11 miles of tunnels connected by embankments comprises the 20-mile distance, and on November 13, the principal tunnel, the Bilemelik was reported completed. In the previous year a tunnel some three miles long through the Amanus range had been finished. The sections last named were considered important links in order to establish direct communication between the Bosphorus and the Egyptian frontier. The line as projected extends from Konia to the Euphrates and to Bagdad and it was divided into three sections by the unfinished gaps. The line from Konia to Basorah, at the head of the Persian Gulf, is 1360 miles in length, and the various sections completed and in operation in 1915 were located as follows: Taurus region, 176 miles; Adana plain, 110 miles; Amanus Mountains and the Euphrates, 160 miles; Babylonia, 82 miles. The Adana-Mersina branch, 41 miles in length, gives access to the sea. In addition to the main line there were some nine branches, for which plans were prepared, amounting to 551 miles, and with the Adana-Mersina and Toprak-Alexandrette portions built and working, 79 miles in length, the projected railway system for this part of Asiatic Turkey would make a total of 1990 miles when completed.

It was reported late in the year 1916 that the Turkish government had canceled the French concession for building a railroad from Smyrna to Kasaba in Asia Minor, 54 miles southeast of Konia, and the Franco-Belgian concession for a

line from Mudania on the Sea of Marmora to Brusa, about 100 miles southeast. These railways are to be built by the state.

**FINANCE.** The monetary unit is the Turkish pound of 100 piasters; its par value is \$4.39642. Budget estimates are shown below in pounds Turkish:

	1915-16	1915-16	1916-17
Revenue . . . . .	80,514,159	25,996,010	22,961,680
Expenditure . . . . .	84,590,561	35,657,540	36,817,120

The largest item of expenditure is for the service of the public debt, which represents 43 per cent of the total estimated outpay. Paper currency totaling £T5,500,000 has been placed in circulation to be repaid in gold six months after the signing of peace, and a further issue will be placed in circulation to be redeemed one year after signing peace. The Ottoman Bank has been authorized to increase the number of its bank notes in circulation. At the beginning of the war this bank had in circulation notes totaling £T4,000,000 and up to the time of presenting the budget an additional £T1,600,000 had been put in circulation. The ordinary expenditure for military establishments constitutes 28 per cent of the budget. This corresponds to the ordinary annual appropriations under this heading, and is in no way related to the extraordinary credits and expenditures caused by the state of war. The total debt stood in April, 1914, at £T151,656,007. The amount borrowed by Turkey for the reestablishment of the Constitution down to 1916 is £T52,488,326, of which £T47,540,012 were required to meet deficits (due to pre-constitution borrowing) and £T7,948,304 for railways. Since the beginning of the war Turkey has received advances from the Central Powers amounting to £T21,613,816. In addition there were to be two further loans in Germany, one of £T20,000,000, and the other of £T1,240,000; making a grand total of £T42,853,816.

**NAVY.** See NAVAL PROGRESS.

**GOVERNMENT.** Turkey is a constitutional hereditary monarchy of which the sultan is both temporal and spiritual head. The succession rests in the senior male descendant of the house of Osman, sprung from the imperial harem. The sultan does not marry; but all children born in the harem, whether of free or slave women, are counted legitimate and of equal lineage. A grand visier appointed by the sultan forms the cabinet; the sheikh-ul-Islam is, under the sultan, the director of ecclesiastical affairs. For administrative purposes the empire is divided into vilayets, sanjaks, kazas, nahies, and kariés. The legislative body is composed of a senate and a chamber of deputies. The constitution of Dec. 23, 1876, abolished in 1877, was reestablished July 23, 1908. Mohammed V, born 1844, emperor of the Ottomans, khalif of the Mussulmans, thirty-sixth sovereign of the house of Osman and twenty-ninth since the taking of Constantinople, is the third son of Abdul Mejid. He succeeded his brother, Abdul Hamid, deposed April 27, 1909; Abdul Hamid had succeeded his eldest brother Mohammed Murad (deposed Aug. 31, 1876), who had succeeded his uncle Abdul Aziz (deposed May 30, 1876), who had succeeded the father of the present sultan deceased June 25, 1861. The oldest son of the sultan succeeds only when there are no surviving uncles or cousins older than himself. The heir-presump-

tive is Yussuf Izzedin (born 1857), son of Abdul Aziz.

### HISTORY

REPORTS ON THE ARMENIAN MASSACRES. Charges against the German government in connection with the Armenian massacres varied from that of actual instigation to the accusation that it took no steps to prevent the massacre. In the summer of 1916 Rev. Harold Buxton, secretary of the Armenian Refugees Fund, spent three months in relief work in the region where the massacre had taken place. He reported in August that the German government, although its influence at Constantinople was supreme and although its consuls were at their posts in Asia Minor, did nothing to prevent the massacre, which was moreover carried out in a very thorough and systematic manner, unlike the previous massacres which had been the outcome of a sudden spread of fanaticism among the Turks. There was evidence, however, that some of the German consuls tried to aid the Armenians, and to prevent their deportation. It was said for example that the German consul at Erzerum appealed to the German ambassador at Constantinople, but received a reply that the German officials could not interfere in the internal affairs of Turkey. Mr. Buxton also reported that the figures concerning the massacres and deportation probably were not exaggerated. Of the 2,000,000 Turkish Armenians he estimated that 1,000,000 had been deported, and 500,000 massacred. Those who escaped to Russian territory numbered, he thought, about 200,000, while the rest were in concentration camps between Aleppo and Mosul, and near the frontiers of Mesopotamia. He reported that these camps, being in a region where Turkish authority was supreme, were still in danger, and that the sufferings from cruelty, privations, and disease were very severe. Another detailed account of the massacres published in 1916 was *La suppression des Arméniens*, by M. René Pinon, in which he attempted to show that the dictum of Abdul Hamid—that the only way to suppress the Armenian question was to suppress the Armenians—had been acted upon with savage thoroughness. It was charged that the atrocities were committed with the complete knowledge of and virtually in complicity with Germany, for the German representatives at Constantinople and in Asia Minor must have been well aware of the circumstances. There had been no official opposition on the part of the Germans, who had even said that the course of the Turks was defensible. Count Reventlow, for example, had declared that Turkey had not only the right but even the duty of chastising the rebellious and bloodthirsty Armenians. According to M. Pinon, about a million Armenians in the provinces had been deported and driven toward the south. Very often they were first exiled and then massacred. From Samsun all the way to Diarbekir not an Armenian was left. Most of them had been massacred, but some had been taken away and others had been converted to Islam. Specific reports of alleged eye-witnesses gave the most revolting details of starvation and massacre. Among those quoted was the United States consul at Karput, who said that the deportations began with the arrest of several thousands of men. Eight hundred more were arrested on

July 5th and on the 6th they were sent up to the mountain, where they were tied together in groups of fourteen and shot. In a neighboring village another group was shut up in the mosque and in the neighboring houses. After being left there three days without food or water they were taken into the neighboring village, backed up against a wall of rock, and shot. Those who survived the bullets were cut to pieces with bayonets and knives. Similar reports, though fragmentary, were so numerous as to give the general impression that the cruelties far exceeded those of any previous massacre and that the Armenians had reason to regret the reign of Abdul Hamid. To cite one more instance, a German traveler, who had recently died, left notes in which he reported the killing of men, women, and children at Marash under circumstances of the most shocking cruelty, accompanied by torture and followed by mutilation of the dead. He said that after the massacre the mob appeared before the German hospital and cried "Long live Germany." It was recorded that the Mussulmans frequently declared it was Germany that had caused the massacres. The number of deaths was variously estimated, the figures being as high as 500,000.

A report of the Armenian Committee for Armenian and Syrian Relief, published at the close of the year, contained specific details indicating the worst conditions. A visit to the "concentration camps" along the Euphrates convinced the observer that they were not so much camps as herding places where thousands were hemmed in by Turkish soldiers and left to die. They died of all manner of diseases, but chiefly of starvation. The camps are scattered throughout North Syria and Arabia, in the desert. Those described in the report were in the Plain of Meskene and its vicinity. In that plain alone, it was said, 60,000 Armenians were buried in mounds containing two or three hundred bodies each. They had perished from starvation, typhus, intestinal and other diseases. He estimated that in the regions visited 50,000 were perishing of starvation. The sufferings of the women at the hands of the tribesmen, who had driven them to these camps, were terrible, and great numbers had died on the way. In the camps they were without shelter or means of procuring food. He believed that unless relief came before the winter there would be no more Armenians left. The British government published a comprehensive volume of documentary and personal evidence under the title of *The Treatment of Armenians in the Ottoman Empire 1915-16*, with a preface by Viscount Bryce.

THE TURKISH REPLY. In February the Turkish government published an official defense of its course in Armenia, alleging that the massacres and deportations had been the result of insurrections incited or indirectly caused by the Entente Powers. A further presentation of the Turkish view was given to the press on October 25th by the Turkish Foreign Minister, Halil Bey, who declared that the Armenians had risen in revolt. He contended that the Young Turk party had dealt fairly by the Armenians. They could not grant their demands for autonomy because the Armenians were only a majority in this territory and there was a large Moslem element which, if this were done, would lose their independence. They could, however, give them a share in the government, and this they had

already done. There had been many Armenians in the Chamber of Deputies and several in the Senate. An Armenian had been a minister and nearly all the vice-ministers were Armenians. When the war broke out the Armenians gathered munitions and perfected their military organization. He and others had warned their representatives that while they were free to make overtures to the Entente after the war in the event of Turkey's defeat, any movement against Turkey during the war would be sternly repressed. When Russia invaded Asia Minor the Armenians had revolted. The punishment had followed. It had been impossible to restrict repressive and punitive measures to any single locality because the uprising had been so well organized and was so widespread. Prompt and sweeping measures had been necessary.

**ARABIAN INDEPENDENCE.** As the summer advanced, reports of a rising in Arabia were frequent, and finally it became known in June that the movement for Arabian independence under the Grand Sherif of Mecca was well advanced. The campaign began on June 9th. The Grand Sherif raised three armies, which he placed respectively under the commands of his three eldest sons. One of the armies besieged Medina, another captured Taif, and the third captured Jeddah. Toward the end of June it was reported that Arabian independence of Turkey had been proclaimed, and that the revolutionary movement had met with marked success. The news was received with enthusiasm by the Moslem populations of India and Morocco. The uprising was in general the outcome of the Pan-Arab movement for the expulsion of the Turks, which was stimulated by the resentment among Mohammedans of the German control of Turkey. The following account appeared in an Arab journal toward the close of the year: The Sherif of Hedjaz, Hussein, on hearing of the atrocities committed by Djemal Pasha in Syria, sent his son to intercede on behalf of the persecuted Arabs, but instead of regarding this intervention, the Turkish leader tried to arrest him and renewed his persecutions. On the return of the Sherif's son, there was a meeting of the leading men of Hedjaz to the number of 400, and he explained to them the situation. The economic condition was growing serious and the people were beginning to lack food. The meeting pronounced in favor of an immediate declaration of independence and chose as its chief the Sherif Hussein. The public ceremony of the coronation, in accordance with the Arab traditional rites, was celebrated at Mecca. The notables assembled in the vestibule of the Holy Temple of the Caaba and the new charter of the Arab Kingdom was read. The dignitaries and representatives of all classes of the people then filed before the newly chosen king, touched his hand, and pronounced their agreement to the contract or formal act by which the sovereignty, according to the ancient tradition of the Arabs, is acknowledged. In August the Sherif of Mecca addressed a proclamation to the entire Moslem world, saying that the Emirs of Mecca had been the first to recognize the Turkish government, and had remained loyal down to the time when the misconduct of the party of Union and Progress brought disaster to the Moslem world. After condemning in general terms the party of Union and Progress, the proclamation went on to specify offenses against religion

and referred to cruelties inflicted upon cultured Moslems and Arabs of distinction. When the Empire fell into the hands of Enver Pasha, Djemal Pasha, and Talaat-Dey, conditions became intolerable. It called upon the Moslem world to defend the faith of Islam, to elevate the Moslem people, and to build up a code of justice in harmony with the principles of religion. It referred especially to the sacrilegious endeavor of the Turks to shell the Holy Temple. In August unsuccessful negotiations were reported between Arab leaders and Enver Pasha as representing Turkey for the recognition of an Arabian Caliphate and Arabian autonomy. Early in September the French government sent a delegation of French Moslems to congratulate the new government and to contribute financial aid. The British government cooperated and British Moslems joined the expedition. On November 11th a communication from Mecca was delivered to the United States government asking for recognition. See **WAR OF THE NATIONS.**

**TURNER, SIR WILLIAM.** A British anatomist and educator, died in Edinburgh Feb. 15, 1916. He was born in Lancaster in 1832, and graduated as bachelor of medicine from London University. In 1854 he was chosen by the famous surgeon Goodsir to be his senior demonstrator in anatomy at the University of Edinburgh, and there he remained, succeeding Goodsir in 1867 as professor of anatomy. This chair he held till 1903, when he became principal and vice-chancellor of the university. Dr. Turner had been president of the Royal Society of Edinburgh, the General Medical Council (1898-1904), and the British Association for the Advancement of Science (1900). Knighted in 1886, he received the K.C.B. in 1901. Honorary degrees were conferred upon him by many universities in Britain and Canada, and by the Western University of Pennsylvania (now University of Pittsburgh); and he was elected to membership in learned societies in all parts of the world. He became known as a successful administrator, as well as a distinguished teacher and investigator; he was an authority on comparative anatomy and anthropology, and especially on craniology, and owned a large collection of human skulls. His writings, comprising 276 titles, were in the form of memoirs, reports, and contributions to scientific journals. Of the *Journal of Anatomy and Physiology*, which he founded in 1866, he was editor till 1894.

**TUSKEGEE NORMAL AND INDUSTRIAL INSTITUTE.** A non-sectarian co-educational institution for negroes. It was founded in 1881 at Tuskegee, Ala. The total enrollment in all departments in the fall of 1916 was 2535 students. The faculty numbered 158. During the year Maj. Robert Russa Moton, known for his work as commandant of cadets at Hampton Institute, became principal as successor to the founder, Booker T. Washington. An anonymous gift of \$250,000 was received for permanent improvement. On May 31st the endowment from which the institute received an income amounted to \$1,957,536. The library contains 22,804 volumes.

**TWAIN, MARK.** See **LITERATURE, ENGLISH AND AMERICAN, Fiction, American.**

**TYPHOID FEVER.** The *Journal* of the American Medical Association, Nov. 17, 1916, presented its fourth annual survey of the ty-

phoid fever mortality in cities of the United States having over 100,000 population, 60 cities being comprised in the survey. The cities are divided into groups, the first including the nine largest cities having a population over 500,000. In seven of these a new low typhoid record was established in 1915, the exceptions being Cleveland and Pittsburgh. In New York City despite an epidemic of considerable proportions, which occurred in Brooklyn, the rate was slightly under that of 1916. The New York Department of Health ascribes the steady reduction in typhoid fever during the past few years to the effective chlorination of the Croton water supply and the pasteurization of milk. These measures had been effective in other cities. Boston and Philadelphia also had localized outbreaks of typhoid. The lowest typhoid rate in this group, 5.4 per 100,000 population, occurred in Chicago; the highest, 24.7 per 100,000 population, occurred in Pittsburgh. Group 2, comprising 10 cities having a population of 300,000 also had a low mortality. Astonishing improvement was shown by the city of Milwaukee, which in 1912 stood at the bottom of the list, whereas during 1915 its mortality rate per 10,000 was only 2.5. The improvement seems mainly due to the reduction of water-borne infection brought about by treating the water supply with chlorine. New Orleans still maintains a relatively high mortality rate. The lowest rate in this group was that of Newark, with 2.5 per 100,000 population. In group 3, comprising cities with from 200,000 to 300,000 population, improvement is still more noticeable, Portland, Ore., standing at the head of the list with 5.2 per 100,000 population, and Columbus, Ohio, last with 13.3 per 100,000. Group 4, containing cities with from 125,000 to 200,000 population, includes several Southern communities which habitually have high mortality rates; but even Atlanta, Birmingham, and Memphis show a lower rate than in previous years. In this group Omaha shows a rate of 3.7, and Birmingham, Ala., a rate of 33.7. In group 5, cities having 100,000 to 125,000 population, Cambridge, Mass., has the lowest mortality rate of any city in the United States, Nashville, Tenn., had the highest rate in this group, namely 35.1 per 100,000.

A summary of the typhoid situation during the period of this survey indicates a general decrease in the typhoid mortality rate throughout the country.

The New York City Department of Health, in its effort to educate the public in typhoid prevention, devotes the *Weekly Bulletin* of Aug. 26, 1916, to a popular exposition of the nature, prevention, and method of communication of this disease. The matter is put in plain, understandable terms. Twelve personal rules on how to keep from getting typhoid fever are thus given: "Keep yourself in good health. Do not use alcoholic drinks. Keep your home and your body clean. Always wash your hands before eating. Drink only the best milk; if in doubt, boil it. Drink only pure water; if in doubt, boil it. Eat only pure, good food. Fresh-cooked food is safest; heat kills the germs. (But the heat of tea and coffee is not often high enough to kill the germs in milk and cream.) Avoid salads, raw vegetables and raw oysters, unless you know they come from a clean place. Wash ice when it comes and keep the icebox clean. Do not put ice in drinking

water or on food. Deal only with good, clean food stores. Don't eat at dirty restaurants. Keep flies out of your rooms and away from your food. Be careful when you go to the country; be sure of what you eat and do not drink from a strange spring or stream. Typhoid fever is especially a country disease. Be immunized before going on a vacation. Never visit where there is a case of typhoid fever. Be careful about friends who have had typhoid fever; they may be 'carriers.' Where there is an outbreak of typhoid fever, use only boiled water for drinking, and also boil milk just before it is used. Eat no raw food of any kind. Fresh-cooked, hot food is safest. If typhoid fever is in your house or neighborhood, or you are exposed to the disease in any way, or are likely to be, have yourself immunized."

The value of antityphoid vaccine has been established beyond all possible doubt. Attempts are now being made to immunize individuals against typhoid and paratyphoid fever at the same time, since these diseases occur under similar conditions and are often difficult to diagnose from one another in their early stages. The administration of mixed vaccines is looked upon by experts somewhat unfavorably, since the mechanisms of body defense are little understood and serum reactions are very complex. Nevertheless, Kabeshima has introduced into the Japanese navy a mixed vaccine comprising equal quantities of *Bacillus typhosus* and the *alpha* (A) and *beta* (B) paratyphoid bacilli, the total dose not exceeding that of the typhoid bacillus alone. As observed, the reaction, both local and general, was similar to those given by the typhoid vaccine, and was not especially severe. The statistics given for inoculations against typhoid and paratyphoid with the occurrence among inoculated and uninoculated, do not justify the drawing of any conclusion as to the prophylactic value of mixed vaccines. Among other observers Vincent speaks highly of the value of mixed vaccine inoculation, basing his conclusions on about 4000 cases. He suggests that it is just as reasonable to vaccinate simultaneously against typhoid and paratyphoid fever as against typhoid and smallpox, which is commonly done. Widal and Chantemesse also hold views favorable to mixed vaccines. The latter suggests a vaccine containing 50 per cent of *Bacillus typhosus*, 30 per cent *Bacillus paratyphosus* A and 20 per cent *Bacillus paratyphosus* B.

**TYPHUS FEVER.** Plotz, of New York, discoverer of the causative bacillus of the disease, gives the results of his work in Serbia in prophylactic immunization against typhus fever. This consisted in the administration of a vaccine containing a suspension of 15 strains of *B. typhi-eazanthematici* (the organism discovered by Plotz and generally accepted as the specific cause of typhus) in physiologic salt solution, which had been subjected to a temperature of 136.4 to 140 F. for a period of 30 minutes to one hour. Each cubic centimeter of this sterilized suspension contained about 2,000,000,000 bacteria, and the vaccine was preserved by the addition of 0.5 per cent carbolic acid or tricresol. Three prophylactic injections were given at intervals of five to six days. In Serbia, 5251 men were vaccinated both before and after the Bulgarian occupation. As the supply of vaccine was limited, immunization was largely



confined to orderlies and members of the hospital staff who were constantly exposed to infection. Among the 5251 vaccinated, there occurred three cases of typhus fever. As the general incidence of the disease among non-vaccinated of the same class is vastly greater than this, immunization is looked upon as a distinct factor in preventing its development. For example, in the town of Radomir, Bulgaria, 20 of the personnel in the hospital developed typhus before the institution of prophylactic immunization. After this was done, although the number of hospital admissions increased, no further cases arose among the members of the staff. In Russia work was done chiefly in the portion of Volhynia occupied at that time by the Austro-Hungarian forces. The cases in this district mounted into the tens of thousands. As in the Balkans, an effort was made to limit vaccination to those who were most exposed to infection, namely, members of the hospital staffs and sanitation units. In 46 institutions 3169 persons were immunized. Up to the end of May, 1916, only three cases of typhus occurred among the vaccinated, whereas, although precise statistics are not available, the unvaccinated suffered more severely. See VITAL STATISTICS.

**TYBOL (TIBOL).** See AUSTRIA-HUNGARY.

**U-53.** See NAVAL PROGRESS; UNITED STATES AND THE WAR.

**UGANDA PROTECTORATE.** A British East African possession, covering an area estimated at 121,437 square miles up to the fifth parallel of north latitude and carrying a population of 2,927,494. Entebbe is the British headquarters. Cotton, cotton-seed, and cattle are main exports. Imports 1914-15, £580,331; exports, £537,363; revenue, £282,831; expenditure, £289,213. Reigning king, Daudi Chua; British governor and commander-in-chief, Sir F. J. Jackson.

**UNEMPLOYMENT.** The year 1916 differed very sharply from the year 1914 and the early part of 1915 in the almost complete absence of any serious problem of unemployment, not only in the United States but in belligerent nations. This was not due only to the high level of industrial effort (see FINANCIAL REVIEW), but in Europe was primarily due to the drafting of millions of men into the armies. There was in fact nearly everywhere a dearth of labor in mechanical pursuits and an unprecedented tendency for women to enter into unwonted occupations (see WOMEN IN INDUSTRY). Legislation in the United States was consequently limited to minor regulations of employment exchanges and investigations of unemployment in Maryland by the Labor Department, and in Massachusetts by the Social Insurance Commission (see SOCIAL INSURANCE). Agitation, however, was continued by the American Association for Labor Legislation (q.v.) in behalf of unemployment insurance as a fundamental feature of a programme of social insurance.

**UNITED STATES.** The legislation in this country was limited. Virginia reenacted a law of 1910 regulating private employment agencies with various changes. The law requires every employment agency to keep a register showing the age, sex, nativity, occupation, name, and address of all applicants; and also a register of the name and address of applicants for help and the nature of employment. Registration fees are limited to \$3; and such fee must be re-

turned in full unless employment is secured within 30 days. In Maryland the State Board of Labor and Statistics was authorized to establish free employment agencies in such parts of the State as seemed advisable. In New York a Bureau of Farm Settlement was created in the Department of Agriculture. In New Jersey, where the Department of Labor was reorganized, the Bureau of Employment was given control of the public employment offices. In California the Legislature endorsed the recommendation of the United States Department of Labor that financial aid be given to unemployed persons taking up homes on the public domain.

The prosperous condition of labor in the United States was shown by statistics in the *Monthly Review* of the United States Bureau of Labor Statistics for September. These statistics were based on a rather extensive survey of the number of working people employed in July, 1916, as compared with July, 1915. While cotton manufacturing showed a decline of 1 per cent and cigar manufacturing of 4.9 per cent, other industries showed the following percentage increases: iron and steel, 27; car building and repairing, 17; hosiery and underwear, 8; woolen, 10; silk, 13.7; men's ready-made clothing, 8.6; and boots and shoes, 23.4. These figures are indicative of the increased demand for labor and the almost complete elimination of unemployment as a serious economic evil. In consequence of these prosperous conditions movements of social workers for the establishment of protection against periods of employment had only a slight effect.

**GREAT BRITAIN.** The *Labour Gazette* showed that the percentage of unemployed workers in British trade unions had steadily declined from 2.5 for January, 1915, to 0.7 in January, 1916, and to considerably less than 0.5 after June, 1916. Thus, trade unions with nearly 1,000,000 members reported 0.4 per cent members unemployed Sept. 30, 1916, a similar percentage Aug. 31, 1916, and 0.9 per cent Sept. 30, 1915. Coal mining, pig iron production, iron, and steel were conspicuous for the increase in the number of workers, while the cotton trade, ready-made clothing, printing and bookbinding, brick and cement production, and food preparation showed considerable declines in the number of workers, some of these actually suffering from a dearth of labor.

**GERMANY.** As in other belligerent countries, labor reports showed that the high state of industrial activity produced by the war had reduced unemployment to a minimum. The metal, engineering, electrical, and chemical trades all showed considerable increases in numbers employed; while certain branches of the clothing trades and the building trades showed declines. Trade union returns covering 806,000 members showed that at the end of August, 1916, the greatest amount of unemployment existed among textile workers, hatmakers, bookbinders, leather workers, and porcelain workers. On the other hand, metal workers, brewery workers, and state and municipal employees showed negligible percentages of unemployed members.

**UNEMPLOYMENT INSURANCE IN GREAT BRITAIN.** The unusual labor conditions created by the war resulted in numerous modifications in the activities of the employment exchange and in important modifications in the scope of unemployment insurance. Under amendments o:

July, 1916, temporary insurance against unemployment was extended to the following additional groups of workmen: men engaged on or in connection with munitions works, as officially defined, with minor exceptions; and all work people engaged in the manufacture of ammunition, fireworks, explosives, chemicals, oils, lubricants, soap, candles, paints, colors, varnish, metals, metal goods, rubber, rubber goods, leather, leather goods, brick, cement, and artificial stone, and saw milling and machine wood work. Such extension is temporary only and will continue not longer than three years from the end of the war nor more than five years from Sept. 4, 1916, whichever period is longer. Any workman with his employer's consent, if engaged in an establishment where some workmen are insured under the new regulations, may be included. Any deficit in the insurance funds will be met by the government.

**UNIFLOW ENGINE.** See STEAM ENGINE.

**UNION COLLEGE.** A non-sectarian institution for the education of men at Schenectady, N. Y., founded in 1795. In the autumn of 1916 there were 548 students and 43 faculty members. Productive funds amounting to \$1,196,802 yielded an income of \$57,509. The total obtained from tuition fees was \$82,119. In the library were 42,000 volumes. President, Charles Alexander Richmond. Under the title Union University the college has associated with it a law school, medical college, Dudley Observatory, and a school of pharmacy in Albany. Dr. Richmond is chancellor of the university.

**UNITARIANS.** According to the official year book for 1916-17 there were on July 1, 1916, 487 churches and 517 ministers in the United States and Canada. No statistics of membership are published, and in this respect the latest available figures were for 1906, when the membership numbered 70,542 in the United States and Canada. The American Unitarian Association, whose headquarters are in Boston, is the governing body of the denomination. Its work is carried on under the departments of publication, religious education, social and public service, publicity, New Americans, and church extension. The denomination is active in the dissemination of its distinctive literature, both by books and tracts, as well as in the defense and propagation of its principles by its periodicals. In 1916 8876 volumes were sold, and every minute, day and night, a Unitarian tract went into some one's hands, a total of 544,875 for the year, 1490 a day, 62 an hour. The department of religious education published the new Beacon Course, the church school edition of the new hymn book, and an Easter service for schools. The department of social and public service reported that 65 churches in 1916 appointed committees to carry on sociological work. Also a very successful four weeks' institute of social service was held in the Meadville School by this department. The department of publicity employed an expert on church efficiency during seven months of the year with excellent results. With his aid, in cooperation with ministers and local members of churches, increased financial results and deepened interest in the work were attained. Under the department of New Americans 19 missionaries went among English and foreign-speaking peoples, including Swedes, Norwegians, Icelanders, Finns, Italians, in 35 stations and missions, preaching

and ministering. In 1916 the membership of the Laborers' Friendly Society in the Japan mission reached 30,000. In 1916 a countrywide evangelistic campaign was carried on in 100 communities, principally in large cities, with 700 meetings, and an aggregate attendance of 50,000. The report of the treasurer of the American Unitarian Association showed that for the year ending April 29, 1916, the income was \$203,629, and the expenditures \$191,672. The denomination has divinity schools at Cambridge, Mass., Meadville, Pa., and Berkeley, Cal. The periodicals are *The Christian Register* and *The Beacon*, published at Boston; *The Unitarian Advance* and *Unity*, published at Chicago; *The Pacific Unitarian*, published at San Francisco; and *Unitarian Word and Work*, a monthly devoted to the practical activities of the denomination. The president of the American Unitarian Association is Rev. Samuel A. Eliot; secretary, Rev. Lewis G. Wilson.

**UNITED BRETHREN.** See MORAVIANS.

**UNITED BRETHREN IN CHRIST.** This denomination, whose theology is practically the same as that of the Methodists, had its spiritual beginning in 1768, as a result of the evangelistic work of Philip William Otterbein, a missionary to the German Reformed Church, who came to America in 1752. The church was not formally organized until 1800. In 1917 the one hundred and fiftieth anniversary of the spiritual birthday of the church was to be celebrated. The church is governed by a general conference elected every four years, and composed of ministerial and lay delegates elected in equal proportions. According to the official statistics for 1916 the Church of the United Brethren in Christ had in that year: churches, 3630, an increase of 73 over 1915; ministers, 1988, an increase of 64; members, 348,585, an increase of 6740 over 1915; Young People's Societies, 1844, an increase of 57; membership of Young People's Societies, 77,645; Junior and Intermediate Christian Endeavor Societies, 746, with a membership of 28,321, an increase of 2011 over 1915; Sunday schools, 3522, an increase of 61 over 1915; Sunday school teachers and officers, 43,843; total Sunday school enrollment, 454,275, an increase of 8296 over 1915. The total church contributions for all purposes in 1916 were \$3,433,180, an increase of \$330,369 over 1915. The value of the church houses in 1916 was \$13,206,561; of the parsonages, \$2,307,904. The leading educational institutions are: Otterbein University, Bonebrake Theological Seminary, Philomath College, Lebanon Valley College, Indiana Central University, Kansas City University, and Lander Clark College. The denominational organ is *The Watchword*, of which Rev. H. F. Shupe, Dayton, Ohio, is the editor.

**UNITED EVANGELICAL CHURCH.** See EVANGELICAL ASSOCIATION.

**UNITED KINGDOM.** The United Kingdom of Great Britain and Ireland is treated in this book under the heading GREAT BRITAIN.

**UNITED PRESBYTERIAN CHURCH OF NORTH AMERICA.** The origin of this denomination dates from 1853, and was due to a union of associate and associate reformed churches. According to the official statement made by the principal clerk of the general assembly there were in 1916, 13 synods, 75 presbyteries, 1143 ministers, 1143 congregations, 156,954 members in America, 43,925 foreign

members, 200,879 total members, 1420 Sunday schools, 178,469 Sunday school scholars, with contributions amounting to \$238,651, and 1048 young people's societies with a membership of 36,514. The total contributions of the church in 1916 amounted to \$3,006,598. Missions are maintained in India, Egypt, and the Sudan. For several years attempts have been made to effect a union of this denomination with the Presbyterian Church in the United States.

**UNITED STATES. POPULATION.** The estimated population of continental United States on July 1, 1916, was 102,017,312. The population on April, 15, 1910, the year in which the census was taken, was 91,972,206. The total population, including outlying territories, in 1916 amounted to 112,444,620. In 1910 it was 101,748,269. The population of the several States and territorial possessions will be found in the articles dealing with them.

**AGRICULTURE.** The general statistics of 1916 for agriculture in the United States and its dependencies will be found in the articles dealing with agriculture and agricultural products. In the section on agriculture in each State article is given the acreage, value, and production of the principal crops in 1916. See also articles on territorial possessions and **UNITED STATES DEPARTMENT OF AGRICULTURE.**

**MANUFACTURES.** In each of the States are given the results of the census for manufactures taken in 1914. Additional information will be found in articles dealing with chief industries, as **COTTON, TEXTILE MANUFACTURING, STOCK RAISING AND MEAT PRODUCTION, etc.**

**MINERAL PRODUCTION.** The production of all metals and minerals in 1916 will be found given in the general article **MINERAL PRODUCTION.** Under each State in which mineral production is important will also be found a section dealing with that subject.

**EDUCATION.** For information relating to educational matters see articles **EDUCATION IN THE UNITED STATES AND UNIVERSITIES AND COLLEGES.** In the articles on each State and Territory will be found a paragraph dealing with educational statistics.

**RELIGION.** For information relating to various denominations see the articles on these denominations. General information relating to religious bodies in 1916 will be found in the article **RELIGIOUS DENOMINATIONS AND MOVEMENTS.**

**FOREIGN COMMERCE.** The tables below dealing with foreign commerce in the fiscal and calendar years summarize the amount of exports and imports during these periods by countries, and by grand divisions. This information will be found in tables I, II, and III. In tables IV and V will be found a classification of the imports and exports in the fiscal year by commodities. The reference to these tables shows that the total imports into the United States in 1916 amounted to \$2,197,883,510, compared with a total of \$1,674,169,740 in 1915 and \$1,893,925,657 in 1914. Thus it will be seen that the imports in 1916 far surpassed the amount of those of 1914, the last fiscal year which was not effected by the European war. As will be seen, there was a slight decrease in 1915 as compared with 1914, due to conditions prevailing in the latter year. When exports are considered a still larger increase is noted. The total exports for the fiscal year 1916 amounted to \$4,333,658,865,

compared with \$2,768,589,340 in 1915, and \$2,364,579,148 in 1914. In examining the table of imports and exports by grand divisions, however, the effects of the war on foreign commerce will at once be noted. Imports from Europe declined from \$895,602,868 in 1914 to \$616,252,749 in 1916. Figures for 1915 and 1916 are practically the same. From North America there was an increase from \$427,399,354 in 1914 to \$591,895,543 in 1916. From South America there was an increase from \$222,677,075 in 1914 to \$391,562,018 in 1916. From Asia and Oceania there was an increase from \$329,096,884 in 1914 to \$533,407,455 in 1916. In the exports to European countries we find the value greatly increased in 1916. It rose from \$1,486,498,729 in 1914 to \$2,999,183,429 in 1916. Exports to all the grand divisions show large increases in 1916. To Asia and Oceania the United States exported goods valued at \$377,711,783 in 1916, compared with \$196,994,033 in 1914. As we now examine the figures relating to the countries at war we will note the effect on commerce for the United States. From Austria-Hungary in 1914 we imported goods valued at \$20,110,834. This had fallen in 1916 to \$1,431,570. From Belgium the value of goods imported in 1914 was \$41,035,532. This had fallen off in 1916 to \$1,478,579. From France the value of goods imported in 1914 was \$141,446,252, and in 1916 \$102,077,620. From Germany there were imported in 1914 goods valued at \$189,919,136. In 1916 this had fallen to \$13,945,743. Italy was less effected by the war. The value of imports was a trifle larger in 1916 than in 1914. Russia, too, increased the value of her exports to the United States. Trade with the United Kingdom was considerably larger in 1916 than in 1914. Figures for the former year are \$308,443,223, and for the latter \$293,661,304.

When we examine the table of exports we find the figures even more significant. The United States exported to Austria-Hungary in 1914 goods valued at \$22,718,258. This value had fallen in 1916 to \$152,929. To Belgium the value of exports in 1914 was \$61,219,894, and in 1916, \$21,844,638. The value of exports to France made a prodigious increase. In 1914 they were valued at \$159,818,924, and in 1916 at \$630,672,604. To Germany, however, exports fell off in value from \$344,794,276 in 1914 to \$288,851 in 1916. Exports to Italy were greatly increased, as they were to practically all the neutral countries. Exports to Russia increased over sixfold. To the United Kingdom the United States sent goods in 1916 valued at \$1,518,046,263, compared with a value in 1914 of \$594,271,863. By examining the table on the chief articles of export in 1916 it will be noted that the exports of iron and steel and their manufactures were valued at \$621,209,453 in 1916, compared with \$225,861,387 in 1915. The value of these exports in 1914 was \$251,480,677. In these items are included the guns and other products of iron and steel employed in the war. In addition to this there were exported cartridges valued at \$37,083,488, dynamite valued at \$3,893,675, and gunpowder valued at \$173,736,374. In 1914 the export of these articles was comparatively small.

**GOLD EXPORTS AND IMPORTS.** The imports of gold for the calendar year 1916 amounted to \$685,990,234. Of this amount \$579,337,169

came from Canada, \$57,131,027 from England. 927. Of this amount \$37,597,178 went to South America. The exports of gold from the United States in America, \$28,659,250 to Cuba, and \$26,131,826 the calendar year 1916 amounted to \$155,792,- to Japan.

TABLE I  
IMPORTS AND EXPORTS BY COUNTRIES—FISCAL YEARS 1914, 1915, AND 1916

Twelve months ending June—

Countries	Imports			Exports		
	1914	1915	1916	1914	1915	1916
<b>EUROPE</b>						
Austria-Hungary . . . . .	\$20,110,884	\$9,794,418	\$1,431,570	\$22,718,258	\$1,288,669	\$152,929
Belgium . . . . .	41,085,582	10,222,860	1,478,579	61,219,894	20,662,815	21,844,688
Denmark . . . . .	3,269,785	3,160,699	3,421,921	15,670,185	79,824,478	55,662,411
France . . . . .	141,446,252	77,158,740	102,077,620	159,818,924	369,897,170	630,672,504
Germany . . . . .	189,919,186	91,872,710	18,945,743	344,794,276	28,863,854	288,851
Greece . . . . .	3,866,594	4,226,008	9,188,984	1,123,511	28,499,646	31,024,868
Italy . . . . .	56,407,671	54,978,726	57,432,486	74,255,012	184,819,668	270,489,922
Netherlands . . . . .	36,294,010	32,518,890	38,534,509	112,215,673	148,267,019	99,232,990
Norway . . . . .	9,197,265	10,668,864	6,851,714	9,066,610	89,074,701	53,878,126
Portugal . . . . .	6,165,065	5,121,989	7,171,295	5,223,048	5,080,087	14,721,674
Russia in Europe . . . . .	20,831,184	2,512,381	3,618,986	80,088,648	37,474,880	183,259,606
Spain . . . . .	24,658,867	18,027,492	27,864,180	80,887,569	38,112,969	52,771,652
Sweden . . . . .	11,590,107	11,661,387	11,846,881	14,644,226	78,278,818	51,939,162
Switzerland . . . . .	25,329,699	19,335,488	21,775,418	1,019,602	2,735,788	3,156,147
Turkey in Europe . . . . .	3,296,525	5,678,878	151,606	2,160,289	640,201	41,421
<b>United Kingdom:</b>						
England . . . . .	248,089,918	214,801,285	261,883,661	548,641,399	835,588,279	1,409,199,584
Scotland . . . . .	27,758,858	23,214,941	26,448,964	33,950,947	53,612,156	66,037,362
Ireland . . . . .	17,818,088	18,335,449	20,110,598	11,679,517	22,594,519	42,809,317
<b>Total United Kingdom . . . . .</b>	<b>293,661,804</b>	<b>256,351,675</b>	<b>308,443,223</b>	<b>594,271,863</b>	<b>911,794,954</b>	<b>1,518,046,263</b>
<b>Total Europe . . . . .</b>	<b>895,602,868</b>	<b>614,354,645</b>	<b>616,252,749</b>	<b>1,486,498,729</b>	<b>1,971,434,687</b>	<b>2,999,183,429</b>
<b>NORTH AMERICA</b>						
Bermuda . . . . .	695,419	500,912	708,680	1,618,816	1,485,950	2,232,935
British Honduras . . . . .	2,099,275	1,348,300	1,246,957	1,899,438	1,882,596	1,480,450
Canada . . . . .	160,689,709	159,571,712	204,018,327	344,716,981	300,686,812	466,884,415
<b>Central American States:</b>						
Costa Rica . . . . .	3,570,864	3,545,167	4,335,415	3,501,366	2,413,818	3,512,849
Guatemala . . . . .	4,078,612	6,558,546	8,724,728	3,601,813	2,769,279	3,847,101
Honduras . . . . .	3,130,328	2,593,524	2,978,473	3,873,512	5,004,443	4,607,433
Nicaragua . . . . .	1,895,248	2,201,910	2,394,824	4,629,084	2,087,678	3,138,595
Panama . . . . .	4,509,719	4,888,186	5,336,299	22,678,284	19,309,053	23,602,598
Salvador . . . . .	1,158,320	1,947,832	2,129,868	2,155,138	3,101,966	3,043,516
<b>Total Central American States . . . . .</b>	<b>17,842,591</b>	<b>21,284,665</b>	<b>25,899,607</b>	<b>39,439,117</b>	<b>33,585,728</b>	<b>41,752,081</b>
Mexico . . . . .	92,690,566	77,612,691	97,676,544	88,748,793	84,164,447	48,308,542
Newfoundland and Labrador . . . . .	1,315,279	1,391,668	1,866,688	5,785,026	5,352,628	7,217,997
<b>West Indies:</b>						
<b>British West Indies—</b>						
Barbados . . . . .	259,715	386,743	395,318	1,412,934	1,281,700	1,645,592
Jamaica . . . . .	6,701,913	5,561,585	4,767,025	5,254,124	4,564,703	6,563,781
Trinidad and Tobago . . . . .	6,875,104	5,535,558	7,009,834	3,465,610	3,257,188	4,407,103
Other British . . . . .	1,714,127	1,768,476	2,232,577	3,224,342	2,776,000	5,213,612
<b>Total British West Indies . . . . .</b>	<b>15,550,859</b>	<b>13,252,362</b>	<b>14,404,754</b>	<b>13,357,010</b>	<b>11,879,591</b>	<b>17,830,068</b>
Cuba . . . . .	131,303,794	185,706,901	228,977,567	68,884,428	75,530,332	127,040,067
Danish West Indies . . . . .	29,374	350,822	63,496	890,966	703,354	898,541
Dominican Republic . . . . .	3,876,834	9,826,397	13,456,653	4,917,201	5,680,299	7,581,358
Dutch West Indies . . . . .	512,959	598,972	844,784	906,540	1,110,588	1,594,055
French West Indies . . . . .	59,968	55,183	88,496	2,083,623	2,256,669	3,500,494
Haiti . . . . .	691,807	1,542,836	2,560,340	5,540,705	3,184,618	6,435,567
<b>Total West Indies . . . . .</b>	<b>152,025,595</b>	<b>211,333,453</b>	<b>260,396,090</b>	<b>96,580,473</b>	<b>100,345,501</b>	<b>164,880,150</b>
<b>Total North America . . . . .</b>	<b>427,399,354</b>	<b>473,079,796</b>	<b>591,895,543</b>	<b>528,644,962</b>	<b>477,075,727</b>	<b>732,890,023</b>

Countries	Imports			Exports		
	1914	1915	1916	1914	1915	1916
<b>SOUTH AMERICA</b>						
Argentina .....	\$45,123,988	\$73,776,258	\$112,512,420	\$45,179,089	\$32,549,606	\$65,998,611
Bolivia .....	70	290	204,904	1,145,555	550,600	1,867,891
Brazil .....	101,329,073	99,178,723	132,663,984	29,983,914	25,629,555	41,202,277
Chile .....	25,722,128	27,689,760	64,154,859	17,432,392	11,377,181	24,389,652
Colombia .....	16,051,120	18,953,023	21,458,029	6,786,158	6,675,564	11,125,232
Ecuador .....	3,595,456	4,478,757	5,848,290	2,967,759	2,845,913	3,462,040
<b>Guiana:</b>						
British .....	110,603	353,397	261,290	1,700,360	1,841,037	2,183,535
Dutch .....	1,026,050	686,509	607,681	711,482	583,092	718,307
French .....	.....	28,159	52,514	295,334	421,297	498,584
Paraguay .....	64,651	28,129	53,337	173,191	40,265	73,452
Peru .....	12,175,723	12,596,648	24,326,689	7,141,252	5,873,474	10,173,176
Uruguay .....	7,715,144	10,492,649	14,475,478	5,641,266	5,171,823	10,274,426
Venezuela .....	9,768,069	13,227,238	14,942,448	5,401,886	5,764,442	8,999,272
<b>Total South America</b>	<b>222,677,075</b>	<b>261,489,563</b>	<b>391,562,018</b>	<b>124,539,909</b>	<b>99,323,957</b>	<b>180,356,555</b>
<b>ASIA</b>						
Aden .....	1,747,810	1,190,205	2,600,559	1,226,262	1,587,676	1,210,140
China .....	39,382,978	40,156,139	71,655,045	24,698,734	16,402,475	25,120,896
<b>China, leased territory:</b>						
British .....	.....	.....	.....	4,047	.....	25,731
French .....	.....	.....	.....	166,114	316,547	375,420
German .....	638,473	221,685	41,187	8,850	.....	115,867
Japanese .....	229,839	451,886	709,046	1,473,339	821,776	720,337
<b>Total China</b>	<b>40,311,340</b>	<b>40,829,710</b>	<b>72,405,278</b>	<b>26,346,084</b>	<b>17,540,798</b>	<b>26,358,251</b>
Korea .....	8,121	8,753	64,487	1,266,263	1,188,444	675,449
<b>East Indies:</b>						
<b>British—</b>						
Brit. India .....	73,680,880	51,982,703	71,745,626	10,854,591	11,606,094	19,298,150
Straits Settlements .....	26,307,860	24,989,878	32,114,598	4,184,674	3,845,765	4,583,318
Other Brit. .....	11,964,737	10,204,656	23,563,122	585,980	488,875	814,567
<b>Tot'l Brit.</b>	<b>111,908,527</b>	<b>87,177,237</b>	<b>177,423,346</b>	<b>15,625,195</b>	<b>15,980,734</b>	<b>24,696,035</b>
Dutch E. Ind. .....	5,334,361	9,245,784	27,716,599	3,676,895	2,771,779	7,396,282
French E. Ind. .....	.....	.....	60,030	161,234	18,911	16,904
Portuguese .....	.....	.....	.....	.....	.....	137
<b>East Indies</b>	<b>.....</b>	<b>.....</b>	<b>.....</b>	<b>.....</b>	<b>.....</b>	<b>137</b>
Hongkong .....	3,085,840	2,044,589	5,401,174	10,696,214	8,185,315	12,005,610
Japan .....	107,355,897	98,882,638	147,644,228	51,205,520	41,517,780	75,098,188
Persia .....	1,948,038	641,081	583,456	2,343	1,352,279	13,495
Russia in Asia .....	2,488,973	881,659	2,302,858	1,214,506	23,353,151	130,255,759
Siam .....	146,545	242,391	237,250	836,870	619,707	741,430
Turkey in Asia .....	12,546,552	6,555,334	712,879	1,168,230	353,919	748
Other Asia .....	75,482	70,722	29,330	.....	.....	1,800
<b>Total Asia</b>	<b>286,952,486</b>	<b>247,770,103</b>	<b>487,181,464</b>	<b>118,425,616</b>	<b>114,470,493</b>	<b>278,470,228</b>
<b>OCEANIA</b>						
<b>British Oceania:</b>						
Australia .....	17,088,534	23,705,010	54,174,324	45,775,216	43,620,676	59,245,084
New Zealand .....	5,125,036	3,539,029	10,379,117	8,950,124	8,365,973	15,219,024
Other British .....	204,692	263,939	648,530	261,295	225,193	215,149
<b>Total British</b>	<b>22,418,262</b>	<b>27,508,028</b>	<b>65,201,971</b>	<b>54,986,635</b>	<b>52,211,842</b>	<b>74,679,257</b>
French Oceania .....	1,549,523	988,968	2,346,263	1,057,303	676,180	996,586
German Oceania .....	14,301	55,337	445,508	219,892	121,383	139,703
Philippine Is. ....	18,162,312	24,020,169	23,232,249	27,304,587	24,755,320	23,426,009
<b>Total Oceania</b>	<b>42,144,398</b>	<b>52,522,552</b>	<b>96,225,991</b>	<b>83,568,417</b>	<b>77,764,725</b>	<b>99,241,555</b>
<b>AFRICA</b>						
Abyssinia .....	3	157	.....	.....	.....	252
Belgian Congo .....	34,666	130,524	72,859	103,132	289,471	41,625
<b>British Africa:</b>						
West .....	638,111	394,751	6,439,412	3,607,869	2,924,575	4,549,740
South .....	2,469,849	4,947,311	19,323,862	14,334,974	14,727,964	21,186,891
East .....	853,621	748,795	496,696	517,927	618,546	2,604,317
<b>Total British</b>	<b>3,956,581</b>	<b>6,090,857</b>	<b>26,759,970</b>	<b>18,960,770</b>	<b>18,271,085</b>	<b>28,340,948</b>
Canary Islands .....	177,356	116,227	180,631	728,673	985,411	819,949
Egypt .....	13,311,233	17,371,992	33,254,943	1,930,016	2,879,241	7,791,421
French Africa .....	844,808	652,253	2,011,222	2,754,228	2,490,204	2,393,527
German Africa .....	134,959	.....	.....	593,935	103,662	44,340
Italian Africa .....	80,290	66,651	169,192	6,479	121,344	155,137
Liberia .....	6,287	37,178	89,900	110,171	152,648	84,677
Madagascar .....	13,095	45,733	104,566	25,795	57,269	394,869

Countries	Imports			Exports		
	1914	1915	1916	1914	1915	1916
Morocco .....	\$149,776	\$60,674	\$318,666	\$89,256	\$69,732	\$348,980
Portuguese Africa .....	440,422	880,835	1,856,841	2,587,472	8,089,460	8,084,188
Spanish Africa .....	.....	.....	2,455	11,588	10,224	17,159
<b>Total Africa</b> .....	<b>19,149,476</b>	<b>24,958,081</b>	<b>64,765,745</b>	<b>27,901,515</b>	<b>28,519,751</b>	<b>43,517,070</b>
<b>Grand total.</b> .....	<b>1,893,925,657</b>	<b>1,674,169,740</b>	<b>2,197,883,510</b>	<b>2,364,579,148</b>	<b>2,768,589,340</b>	<b>4,833,658,865</b>

TABLE II—IMPORTS AND EXPORTS BY GENERAL DIVISIONS, FISCAL YEARS 1914, 1915, AND 1916

Fiscal Years Ending June 30—	IMPORTS					
	Europe	North America	South America	Asia and Oceania	Africa	Total
1914 .....	\$895,602,868	\$427,899,854	\$222,677,075	\$329,096,884	\$19,149,476	\$1,893,925,657
1915 .....	614,854,645	478,079,796	261,489,568	800,292,655	24,958,081	1,674,169,740
1916 .....	616,252,749	591,895,543	891,562,018	533,407,455	64,765,745	2,197,883,510

Fiscal Years Ending June 30—	EXPORTS					
	Europe	North America	South America	Asia and Oceania	Africa	Total
1914 .....	\$1,486,498,729	\$528,644,962	\$124,539,909	\$196,994,033	\$27,901,515	\$2,364,579,148
1915 .....	1,971,434,687	477,075,727	99,823,957	192,285,218	28,519,751	2,768,589,340
1916 .....	2,999,188,429	782,890,028	180,356,555	377,711,783	43,517,070	4,833,658,865

TABLE III—IMPORTS AND EXPORTS BY GENERAL DIVISIONS, CALENDAR YEARS, 1914, 1915, AND 1916

Calendar Years	IMPORTS					
	Europe	North America	South America	Asia and Oceania	Africa	Total
1914 .....	\$783,517,509	\$441,400,758	\$229,520,375	\$815,176,388	\$19,669,971	\$1,789,276,001
1915 .....	546,352,567	509,458,281	322,282,189	865,865,167	34,638,491	1,778,596,695
1916 .....	638,316,911	658,457,095	427,609,562	610,377,429	61,893,338	2,891,654,335

Calendar Years	EXPORTS					
	Europe	North America	South America	Asia and Oceania	Africa	Total
1914 .....	\$1,389,295,916	\$481,588,221	\$ 91,013,339	\$176,402,751	\$25,822,823	\$2,118,624,050
1915 .....	2,573,408,120	558,803,012	144,128,681	241,185,800	37,145,234	3,554,670,847
1916 .....	3,813,621,677	924,653,691	220,288,188	468,787,698	54,072,335	5,481,423,589

TABLE IV  
CHIEF ARTICLES OF IMPORT, 1915-1916

Articles	Articles	
	1915	1916
Automobiles .....	\$ 68,107,818	\$120,000,866
Breadstuffs .....	578,823,676	435,696,629
Chemicals, drugs, dyes, and medicines .....	46,880,986	124,362,167
Coal .....	55,906,140	65,958,275
Copper, and manufactures of .....	99,558,030	173,946,226
Cotton: .....		
Manufactures of .....	71,974,497	112,053,127
Unmanufactured .....	376,217,972	874,186,247
Fertilizers .....	8,870,887	5,843,497
Fish .....	12,870,790	19,983,545
Fruits, including nuts .....	34,933,117	36,965,328
Iron and steel, and manufactures of, not including ore .....	225,861,387	621,209,453
Leather, and manufactures of .....	120,727,156	146,613,815
Meat and dairy products .....	220,051,347	291,057,602
Mineral oils .....	133,693,275	166,423,230
Naval stores .....	11,127,239	18,503,607
Oil cake and oil cake meal .....	28,879,051	28,541,304
Paraffin and paraffin wax .....	10,589,843	12,873,250
Paper, and manufactures of .....	19,848,358	29,111,004
Tobacco: .....		
Manufactures of .....	6,468,688	6,944,147
Unmanufactured .....	44,493,829	53,163,595
Vegetable oils .....	25,831,745	27,167,220
Wood, and manufactures of .....	49,787,303	60,707,229

CONDITION OF THE TREASURY. Table A on page 705 shows the financial condition of the United States Treasury on Dec. 30, 1916.

EXPENDITURES AND APPROPRIATIONS. Table B on page 705 shows the appropriations of the government for the fiscal year 1917, and expenditures for the fiscal year 1916, classified as follows: Legislative establishment, executive proper, State department, treasury department, war department, department of justice, post office department, navy department, interior department, departments of agriculture, commerce, and labor, independent offices and commissions,

TABLE V  
CHIEF ARTICLES OF EXPORT, 1915-1916

Articles	Articles	
	1915	1916
Agricultural implements .....	\$ 10,304,978	\$ 17,611,297
Animals .....	77,953,686	99,662,813

TABLE A—CURRENT ASSETS AND LIABILITIES

ASSETS		LIABILITIES	
Gold coin .....	\$909,629,128.60	Gold certificates outstanding .....	\$1,922,076,629.00
Gold bullion .....	1,264,973,780.53	Gold reserve .....	152,979,025.68
		NOTE.—Reserved against \$346,681,016 of U. S. notes and \$2,035-188 of Treasury notes of 1890 outstanding. Treasury notes are also secured by silver dollars in the Treasury.	
		Available gold in general fund .....	99,547,254.50
<b>Total .....</b>	<b>\$2,174,602,909.13</b>	<b>Total .....</b>	<b>\$2,174,602,909.13</b>

ASSETS		LIABILITIES	
Silver dollars .....	\$495,939,455.00	Silver certificates outstanding .....	\$476,795,618.00
		Treasury notes of 1890 outstanding ..	2,035,188.00
		Available silver dollars in general fund ..	17,108,654.00
<b>Total .....</b>	<b>\$495,939,455.00</b>	<b>Total .....</b>	<b>\$495,939,455.00</b>

ASSETS		LIABILITIES	
Available gold (see above) .....	\$99,547,254.50	Treasurer's checks outstanding .....	\$4,332,491.63
Available silver dollars (see above) ..	17,108,654.00	Deposits of Government officers:	
United States notes .....	5,409,462.00	Post Office Department .....	16,201,612.92
Federal reserve notes .....	2,092,945.00	Board of trustees Postal Savings System (5 per cent reserve) .....	4,046,800.96
Federal reserve bank notes .....	61,585.00	Comptroller of the Currency, agent for creditors of insolvent banks ..	1,158,509.02
National bank notes .....	18,007,794.49	Postmasters, clerks of courts, etc. . .	22,024,140.14
Certified checks on banks .....	21,379.30	Deposits for:	
Subsidiary silver coin .....	3,328,762.02	Redemption of Federal reserve notes (5 per cent fund) .....	16,973,269.29
Minor coin .....	681,026.03	Redemption of Federal reserve bank notes (5 per cent fund) .....	400,000.00
Silver bullion (available for subsidiary coinage) .....	7,051,804.16	Redemption of national bank notes (5 per cent fund) .....	27,281,218.72
Unclassified (unsorted currency, etc.)	1,074,486.78	Retirement of additional circulating notes, act May 30, 1908 .....	3,697,675.00
Deposits in Federal reserve banks ..	28,233,105.82	Exchanges of currency, coin, etc. . .	15,556,985.89
Deposits in national banks:			
To credit of Treasurer United States	32,416,512.65		
To credit of other Government officers	6,769,118.93		
Deposits in Philippine treasury:			
To credit of Treasurer United States	1,208,934.39		
To credit of other Government officers	3,152,765.56		
<b>Total .....</b>	<b>\$226,110,540.68</b>	Net balance, including \$81,156,150.83 to credit of disbursing officers	\$111,622,708.07
		<b>Total .....</b>	<b>\$226,110,540.68</b>

RECEIPTS AND DISBURSEMENTS, DEC. 30, 1916			
Customs receipts .....	\$85,526.32	Ordinary disbursements .....	\$1,804,162.90
Ordinary internal-revenue receipts ..	562,140.80	Panama Canal disbursements .....	1,250.23
Income-tax receipts .....	72,882.52	Public debt disbursements .....	
Miscellaneous receipts .....	140,920.05	Balance Dec. 30, 1916 .....	114,487,837.56
<b>Total ordinary receipts .....</b>	<b>\$861,469.69</b>		
Panama Canal receipts .....	195,405.68		
Public debt receipts .....	116,250.00		
Balance previous day .....	114,620,125.32		
<b>Total .....</b>	<b>\$115,798,250.69</b>	<b>Total .....</b>	<b>\$115,798,250.69</b>

TABLE B		Fiscal Year	
District of Columbia, interest on public debt, and appropriations and expenditures for the Panama Canal.		1917	1916
<b>ORDINARY:</b>			
Legislative establishment .....	\$7,645,913.26	Naval establishment .....	86,578,767.73
Executive proper .....	817,981.75	Civil establishment .....	470,811.52
State Department .....	3,005,350.96		80,630,828.45
Treasury Department—			426,807.30
Excluding Public buildings .....	33,588,087.59	Interior Department—	
Public buildings .....	9,544,487.99	Excluding Pensions and Indians .....	18,570,024.12
War Department—		Pensions .....	78,439,004.30
Military establishment .....	173,555,719.99	Indians .....	19,986,109.52
Civil establishment—		Department of Agriculture .....	15,839,867.11
War Department proper .....	1,161,760.93	Department of Commerce .....	6,288,258.81
Miscellaneous civil .....	4,080,835.44	Department of Labor .....	2,032,283.49
Rivers and Harbors .....	15,991,191.72	Independent offices and commissions .....	8,611,549.47
Department of Justice .....	5,552,242.17	District of Columbia .....	7,524,613.91
Post Office Department—		Interest on public debt .....	11,530,339.04
Excluding Postal Service .....	907,618.39	<b>Total (ordinary) .....</b>	<b>\$506,722,313.71</b>
Postal Deficiencies .....			\$880,745,556.86
		<b>PANAMA CANAL:</b>	
		Pay warrants for constructions, etc. ....	\$9,592,564.83
			\$9,471,821.53

\* Excess repayment in relief of American citizens' account.

**PUBLIC DEBT.** The total outstanding public debt bearing interest on Dec. 31, 1916, amounted to \$972,469,290. The debt bearing no interest amounted to \$253,021,834, and the debt on which interest had ceased since maturity amounted to \$1,463,190. The gross debt on Dec. 31, 1916, was \$1,226,954,314, and the net debt \$1,132,639,195.

**CIRCULATION STATEMENT.** The following table shows the amount and kinds of money in circulation in the United States on Dec. 31, 1916, and the per capita circulation on that date:

<i>Circulating Medium</i>	<i>Jan. 1, 1917</i>	<i>Jan. 1, 1916</i>
Gold coin (including bullion in Treasury).....	\$679,702,890	\$612,561,038
Gold certificates.....	1,660,030,029	1,281,149,229
Standard silver dollars..	72,830,864	66,688,222
Silver certificates.....	476,795,613	485,708,663
Subsidiary silver.....	190,171,820	169,979,213
Treasury notes of 1890..	2,035,188	2,168,424
United States notes....	841,271,554	840,516,432
Federal reserve notes....	298,018,285	203,782,980
Federal reserve bank notes	11,784,495	.....
National bank notes....	708,817,446	746,679,970
<b>Total .....</b>	<b>\$4,440,932,684</b>	<b>\$3,909,184,171</b>
Population of continental United States estimated at .....	103,287,000	
Circulation per capita .....	\$43.00	

**ARMY.** The authorized enlisted strength of the army, in accordance with the act of June 3, 1916, is as follows: Infantry, 38 regiments, 51,224; cavalry, 17 regiments, 17,357; field artillery, 9 regiments, 7881; engineers, 3 regiments and 1 mounted company, 2198; coast artillery corps, 21,423; staff corps and departments, 19,224; Philippine scouts, 5733; miscellaneous organization and special allowances, 13,857; or a total of 138,897. The actual strength of the army on June 30, 1916, was 107,641, which includes 102,616 enlisted men, and 5025 officers. Efforts were made during the year to increase the army to its authorized strength, but it had fallen considerably short of this at the end of the year.

For various phases of the army's activity, see **MEXICO; MILITARY PROGRESS; MILITIA; UNITED STATES MILITARY ACADEMY.**

As regards legislation the year 1916 was one of the most important in the history of the military establishment.

In the last week of March the House of Representatives by a vote of 402 to 2 passed the bill for reorganizing and enlarging the army. This was known as the Hay bill. Several amendments to the bill were rejected. Among these was one prepared by Representative Kahn of California, making an enlarged army of 120,000 instead of 140,000. In the voting on the bill party lines were not regarded. On the amendment just noted above 44 Republicans voted against it and 33 for it. By the amendment to the bill the term of enlistment in the army was shortened. Provision was made that after one year of honorable efficient service an enlisted man might be furloughed to the regular army reserve for six years. In the original bill the term was three years and four years in the reserve. A new provision was added authorizing the President to call out this reserve without the consent of Congress if necessary. By another amendment authority was given for detaching officers of the regular army as instructors at any school or college where a company of more than 100 students is maintained. Conditions were that the student should have three hours a week training for two years, and

five hours a week for the succeeding two years. After graduation his service in the army continued for six months. He would then be placed in the officers' reserve, bound to respond to a call within ten years. It was estimated that an officers' reserve of 50,000 men would be created.

In the summer of 1915, 3383 men attended military training camps; in 1916, 16,134, distributed as follows: Plattsburg, N. Y. (five camps), 12,198; Fort Oglethorpe, Ga. (two camps), 556; Fort Sam Houston, Texas, 421; Monterey, Cal., 1090; Fort Douglas, Utah, 578; American Lake, Wash., 125; Fort Terry, N. Y. (for boys of 15-18), 1166. Congress in 1916 established the legal status of these camps under the control of the United States army and provided \$2,000,000 for their use. Transportation, subsistence, and uniforms are to be furnished the "rookies" by the government. Senior Camps are for men from 18 to 45 (and 45 to 55, on special permission), Junior Camps for boys from 15 to 18. The Military Training Camps Association (19 West 44th Street, New York) and other similar civilian organizations expected an attendance of 50,000 in 1917. In August-September 2500 men were taken on United States war vessels for the first Naval Training Cruise in the Atlantic.

An army reorganization bill known as the Chamberlain bill passed the Senate on April 6th without a roll call. Scarcely a dozen Senators opposed its passage. In the final form the bill differed widely from the Hay bill dealing with the same subject as passed by the House. The Senate bill provided for a regular army of 250,000 men; for a Federal volunteer army, similar to the continental army plan of Secretary Garrison of 261,000 volunteers; for military instruction in schools and colleges; for making the term of enlistment in the five-year period, two years with the colors and three years in the reserve. The most significant provisions of the bill were added at the last moment, under a stress of the knowledge that the President was about to address Congress on the submarine controversy with Germany. These provisions deal with the increase of the army to 250,000 men, and the training of school boys for military service. The House and Senate bill then went into conference. The chief point of difference between the House and the Senate conferees in considering the army bill was in relation to the size of the regular army. The House conferees also refused to concur in the provisions of the Senate bill for a Federal volunteer reserve army. When the bill finally emerged from the conference an agreement had been made on a maximum force of 160,000 men with a possible maximum of 175,000. In May the bill passed the Senate without a roll call, and the House by a vote of 349 to 25. For an outline of the measure, see **MILITARY PROGRESS.**

The House military committee on June 14th ordered a favorable report on the army appropriation bill, carrying \$157,123,099. In addition to providing for regular army increases, federalization of the national guard, and civilian training camps, authorized by the new army reorganization bill, the measure created an executive council for mobilization of the forces for national defense. The bill passed the House on June 26th without the formality of a roll call. It then went to the Senate. On July 3rd, Senator Chamberlain introduced an army ap



propriation bill carrying appropriations amounting to \$328,000,000 for the fiscal year. The bill was finally passed slightly reducing the amount. The Senate struck out the provision of the House bill providing for a military council, and added an amendment providing for a council of national defense for the coordination of industries and resources to be composed of the secretaries of state, war, and navy, chief of staff of the army, an officer of the navy, not below the rank of captain, and six persons to be appointed by the President. The Senate also restored the age limit to 21 years instead of 18, as had been provided by the army reorganization bill. There was incorporated in the bill the revised articles of war, which had in several measures passed both houses.

On June 26th the House had passed a bill for expenditures of the army. The original bill called for \$153,000,000, but the mobilization of the national guard and other expenses made it necessary to make additional appropriations. The Senate Military Committee added more than \$60,000,000 to the estimate presented to the House, and the War Department requested a special appropriation of \$15,000,000 for aviation. The Hay resolution, which would have had the effect of drafting the national guardsmen into the regular army, passed the Senate on June 6th, by a vote of 40 to 30. A provision inserted in the House for the relief of guardsmen's families was struck out, but national guardsmen with dependent families were allowed to obtain honorable discharge from the service. This amendment was rejected by the House, and was taken into a joint conference. As a result of this, both the proposed appropriation for guardsmen's families and the exemption of members from the guard who had others dependent upon them for support were struck out. Mr. Hay introduced a separate measure appropriating \$2,000,000 for the relief of dependent families of guardsmen called into service, and this was passed in both houses. The appropriation bill as finally agreed upon by both houses was vetoed by President Wilson on August 18th, because a rider had been attached by Representative Hay exempting army officers of the retired list from army discipline and liability to trial by court-martial. Military authorities opposed this exemption, urging that it would be destructive of all discipline since the retired officers are expected to serve in time of war. The bill was at once reintroduced and the objectionable addition was stricken out. It was passed and was signed by President Wilson. On December 7th, Maj.-Gen. Hugh L. Scott, in his annual report issued on that date, made a strong plea for universal military training. He declared that the training period of 75 days in three years provided by the army reorganization bill was entirely inadequate. He declared that in his opinion a year of intensive training was required to make a soldier. He gave statistics in which he showed that in 11 States with 16,600 enrolled guardsmen at the time of call more than 10 per cent failed to respond and 29 per cent of the remainder could not pass the physical test. He showed in his report that an aggregate force of 151,096 officers and men of the guard were mustered into the Federal service, and about 110,957 were on the border a month and a half after the call was issued. On Aug. 31, 1916, the regular army

was 29,130 short of its authorized strength, and between March 15th and August 1st, only 8463 additional men were enlisted.

Hearings were begun before the Senate on military affairs on December 18th in regard to a compulsory military training bill prepared by Senator Chamberlain. Before this committee General Scott declared that 3,000,000 fully equipped troops should be available within 90 days after the outbreak of any war involving the United States.

**NAVY.** The naval appropriation bill for the fiscal year 1917, which was approved on Aug. 29, 1916, makes the largest appropriation in the history of the United States navy. In addition to this, for the first time the policy of a continuous programme for new construction was adopted. For details, see article **NAVAL PROGRESS.** Prior to the passage of the appropriation act there had been legislation providing for the utmost facilities at the Naval Academy for the education and training of officers of the navy. In addition to the permanent force provision was made for the first time for an adequate naval reserve force which might be utilized in time of national need. A government armor plant was provided for, as was also a government projectile plant, and a large appropriation was made available for increasing the ship-building facilities of the navy yards. There was also authorized a great navy experimental laboratory where, with the advice and assistance of civilian scientists and engineers, experimental and development work of the utmost importance was to be carried out.

During the fiscal year 1916 there were added to the active fleet in commission four battleships, of a type as powerful as any possessed by any other naval power. These vessels were the *Oklahoma*, *Nevada*, *Pennsylvania*, and *Arizona*. In addition there were added to the fleet during the year nine destroyers, eight submarines, and a submarine tender. There were under construction five battleships, eight destroyers, and a large number of submarines. The fleet took part during the year in service in Haiti and the Dominican Republic. (See *Foreign Relations*.) It was also represented at the inauguration of the Emperor of Japan.

The annual strategic maneuvers of the fleet took place in August in the north Atlantic. In these maneuvers 83 vessels were engaged, of which 28 were battleships, and 13 submarines. The operations of the maneuvers lasted for four days, and developed most interesting and instructive situations. On July 15th, the U. S. S. *Hector* was wrecked off the coast of South Carolina, and on August 29th the battleship *Memphis*, the flagship of the commander of the cruiser force, lying off the city of Santo Domingo, was driven ashore by heavy seas without previous warning. Forty lives were lost in this wreck, 33 from the swamping of the ship's boat caught in the effort to return to the ship, and 7 killed and 15 injured by the bursting of a steam pipe in the engineering room. For aviation see **AERONAUTICS.**

**POST OFFICE.** The receipts for the Post Office Department for the fiscal year ending June, 1916, amounted to \$312,057,688, an increase of \$24,809,523 over the fiscal year 1916. The expenditures were \$306,204,033, an increase over the preceding year of \$7,658,006. A surplus of \$5,216,243 was turned into the treasury.

During the year it was necessary to suspend the parcel post between the United States and Austria-Hungary, Germany, and the Netherlands on account of the lack of necessary transportation facilities due to the war. At the end of the year the service therefore was not in operation in these countries. Notwithstanding these interruptions the weight of the parcel post mails dispatched from the United States to foreign countries shows an increase of 77 per cent over the mails dispatched in 1915. The growth and development of domestic parcel post business was consistent during the year.

From March 4, 1914, to April 1, 1916, the rural mail service was extended to 658,571 families, or approximately 3,000,000 patrons, most of whom were formerly remote from any postal facilities.

The continued growth of the postal savings system affords convincing evidence of the utility of this branch of the postal service. During the fiscal year 1916 there was a gain of 77,523 in the number of depositors, and \$20,235,177 in deposits. On June 30, 1916, there were approximately 603,000 depositors with \$86,019,885 to their credit.

**PENSIONS.** There were paid out for pensions during the fiscal year 1916 \$159,155,089. The total pensioners on the roll on June 30, 1916, were 709,572, compared with 748,147 on the same day in 1915. The Civil War soldiers on June 30, 1916, numbered 362,277, compared with 396,370 in 1915. There were 34,252 deaths among the Civil War soldiers in 1916. There were in 1916 115 surviving widows of soldiers of the War of 1812 drawing pensions. There were 513 survivors of the War of Mexico drawing pensions. The number of the pensioners of the war with Spain was 28,472. On April 27, 1916, there was approved a medal of honor roll, each person on this roll receiving an additional pension of \$10 per month for life.

**PATENTS.** The total number of applications received for patents in 1916 was 70,303, compared with 69,349 in 1915. The total number of applications awaiting action was 16,569, a decrease of 1711. The total number of patents granted in 1916 was 46,133.

**BUREAU OF MINES.** During the year this bureau trained more than 4800 miners in mine rescue and first aid. It sent mining engineers and trained rescue crews to the scene of 89 mine accidents throughout the United States. Studies to prevent diseases arising from work in mines were conducted in Montana, Missouri, and other States. For other scientific activities of the government see SMITHSONIAN INSTITUTION. See also METALLURGY.

**DIPLOMATIC SERVICE.** American ambassadors in the warring countries continued to perform

the duties entrusted to them as representatives of belligerent governments. The burden fell especially hard upon Ambassador Gerard, in Berlin, and Ambassador Sharp in Paris. Ambassador Page in London was also engaged in many important negotiations during the year. One of the important changes was the appointment of David R. Francis of St. Louis to Russia to replace George T. Marve, of California, who resigned on account of ill health. The American ambassador to Russia had charge of German, Austro-Hungarian, and Turkish interests in that country. On February 25th, the Senate confirmed the nomination of Henry P. Fletcher as ambassador to Mexico, but he did not take up the duties of this position during the year on account of conditions prevailing in that country. Joseph H. Shea of Indiana was appointed ambassador to Chile. Abram F. Elkus was appointed ambassador to Turkey, to succeed Henry Morgenthau, who resigned to taken an active part in the political campaign in behalf of President Wilson. Henry Van Dyke resigned as minister to the Netherlands in December, and J. W. Garrett of Maryland was appointed to succeed him. On July 13th the State Department announced transfers to new posts of 41 American consuls in Europe, the changes being required in some instances because of conditions brought about by the war. Viscount Chinda was recalled to Japan and Aimaro Sato was appointed his successor. Dr. V. K. Wellington Koo, Chinese minister, resigned his position on December 28th, on a plea of ill health, but the resignation was not accepted. The Austrian ambassador in charge of subordinate officers during the year, Ambassador Dumba, was recalled in 1915, but did not formally resign his post until Nov. 4, 1916. Announcement was made on November 10th, that Count Adam Tarnowski von Tarnow had been appointed Austrian ambassador to succeed Dr. Dumba. He had seen previous service in Washington, as secretary of the Austrian ambassador from 1899 to 1901. The Government of Great Britain refused to grant safe conduct to Count Tarnowski on the ground that even though international law sanctions the granting of such safe conduct, the Austrian and German ambassadors to neutral countries had so far exceeded their legitimate functions that it was impossible to accede to such a request. The United States government finally prevailed in securing reconsideration of this decision, and Count Tarnowski was permitted to take passage for the United States.

The following table gives the list of American representatives to foreign countries and foreign representatives to the United States in 1916:

AMBAS S A D O R S

Country	Accredited by United States	Year	Accredited to United States	Year
Argentina	F. J. Stimson, Mass.	1914	Rómulo S. Náo	1911
Austria-Hungary	Frederic C. Penfield, Pa.	1913	Domício da Gama	1911
Brazil	Edwin V. Morgan, N. Y.	1913	J. J. Jusserand	1903
Chile	Joseph H. Shea, Ind.	1916	Johann Heinrich, Count von Bernstorff	1908
France	W. G. Sharp, Ill.	1912	Sir Cecil Arthur Spring-Rice	1913
Germany	James W. Gerard, N. Y.	1913	Count Vincenzo Macchi di Cellere	1914
Great Britain	Walter Hines Page, N. Y.	1913	Aimaro Sato	1916
Italy	Thomas Nelson Page, Va.	1913	George Bakméteff	1911
Japan	George W. Guthrie, Pa.	1913	Don Juan Riano y Gayangos	1913
Mexico	Henry P. Fletcher, Pa.	1916		
Russia	David R. Francis, Mo.	1916		
Spain	Joseph E. Willard, Va.	1913		
Turkey	Abram I. Elkus, N. Y.	1916		

MINISTERS PLENIPOTENTIARY

Country	Accredited by United States	Year	Country	Accredited to United States	Year
Belgium	(Unofficial) Brand Whitlock, O.	1918	E. Havenith		1911
Bolivia	John D. O'Rear, Mo.	1918	Ignacio Calderón		1904
China	Paul S. Reinsch, Wis.	1918	Y. K. Wellington Koo		1915
Colombia	Thaddeus Austin Thompson, Tex.	1918	Don Julio Betancourt		1912
Costa Rica	Edward J. Hale, N. C.	1918	Manuel Castro Quesada		1915
Cuba	William E. Gonzales, S. C.	1918	Carlos M. de Céspedes		1914
Denmark	Maurice F. Egan, D. C.	1907	Constantin Brun		1918
Dominican Republic	W. W. Russell	1915	Dr. A. Perez-Perdomo		1915
Ecuador	Charles S. Hartman, Mont.	1918	Dr. Don Gonsalo S. Oórdova		1918
Greece*	Garrett Droppers	1914			
Guatemala	William H. Leavell, Miss.	1918	Joaquin Antonio Mendes		1912
Haiti	Arthur Bailly-Blanchard, Wis.	1914	Solon Menos		1914
Honduras	John Ewing, La.	1918	Dr. Alberto Membreno		1912
Netherlands †	John W. Garrett, Md.	1916	W. L. F. C. Van Rappard		1918
Nicaragua	Benjamin L. Jefferson, Colo.	1918			
Norway	Albert G. Schmedemann, Wis.	1918	H. H. Bryn		1910
Panama	William J. Price, Ky.	1918	Don Eusebio A. Morales		1918
Paraguay	Daniel F. Mooney, N. Y.	1909	Hector Velazquez		1918
Persia	John L. Caldwell, Ill.	1914	Mehdi Khan		1914
Peru	Benton McMillin, Tenn.	1918			
Portugal	Thomas H. Birch, N. J.	1918	Viscount de Alte		1903
Rumania ‡	Charles J. Vopicka, Ill.	1918			
Salvador	Boaz W. Long, N. Mex.	1914	Dr. Rafael Zaldívar		1915
Siam			Phya Prabha Karavongse		1918
Sweden	Ira N. Morris, Ill.	1914	W. A. F. Ekengren		1912
Switzerland	Pleasant A. Stovall, Ga.	1918	Paul Ritter		1909
Uruguay	Robert E. Jeffrey	1916	Carlos María de Pena		1911
Venezuela	Preston McGoodwin, Okla.	1918	Santos A. Dominici		1914

\* Accredited also to Montenegro. † Accredited also to Luxemburg. ‡ Accredited also to Serbia and Bulgaria.

**CABINET.** The second split in the cabinet of President Wilson came on Feb. 10, 1916, when Secretary of War Lindley M. Garrison presented his resignation to the President. This action came as a result of the differences of opinion in regard to the proposed bills for the increase of the army. Early in 1915 President Wilson had requested Mr. Garrison to prepare a plan for reducing the military deficiencies of the country. For many months the Secretary concentrated his efforts upon this problem, and finally evolved a scheme which in the autumn of 1915 was accepted by President Wilson and made a part of the official administration programme. In his annual message to Congress delivered on Dec. 7, 1915, the President warmly commended this plan and recommended its enactment by Congress. Mr. Garrison's programme included, first, a considerable enlargement of the regular army, and, second, the formation of a reserve body of about 400,000 men to be known as the continental army, and to be made up for the most part of men taking a brief but thorough training to number about 33,000 each year.

The committee on military affairs of the House of Representatives had in the meantime prepared a bill, the distinctive feature of which was an increase in the number of the national guard, and the payment of these bodies out of the national treasury. President Wilson having delivered his message to Congress, found among the members of the committee in the House little support for the plans formulated by Secretary Garrison. Mr. Kitchin, the floor leader of the Democrats, was openly opposed to preparedness in any comprehensive form, and Mr. Hay, chairman of the military committee, was entirely out of sympathy with the plans of the administration and its programmes.

In order to arouse interest among the people, and especially in the Middle West, President Wilson in the latter part of January and the first days of February made a tour of the Middle West. He was absent from Washington a week, and made 20 speeches, 10 of which were of a formal nature. He spoke at Pittsburgh, Cleveland, Chicago, Milwaukee, Des Moines,

Kansas City, and St. Louis. On his return he conferred freely with members of Congress and allowed it to become known that he was no longer committed to any particular plan and was entirely open to conviction. On February 9th, five days after the President's return from his speech tour, Secretary Garrison wrote him a letter, the most important parts of which are as follows:

*My Dear Mr. President:*

Two matters within the jurisdiction of this department are now of immediate and pressing importance, and I am constrained to declare my position definitely and unmistakably thereon. I refer, of course, to the Philippine question and the matter of national defense.

You know my convictions with respect to each of them. I consider the principle embodied in the Clarke amendment an abandonment of the duty of this nation and a breach of trust toward the Filipinos; so believing, I cannot accept it or acquiesce in its acceptance.

I consider the reliance upon the militia for national defense an unjustifiable imperiling of the nation's safety. It would not only be a sham in itself, but its enactment into law would prevent, if not destroy, the opportunity to procure measures of real, genuine national defense. I could not accept it or acquiesce in its acceptance. I am obliged to make my position known immediately upon each of these questions—in a speech on Thursday afternoon upon the national defense question and in a communication to the House committee having charge of the Philippine question. If, with respect to either matter, we are not in agreement upon these fundamental principles, then I could not, with propriety, remain your seeming representative in respect thereto. Our convictions would be manifestly not only divergent, but utterly irreconcilable.

You will appreciate the necessity of timely knowledge upon my part of the determination reached by you with respect to each of these matters, so that I may act advisedly in the premises.

Sincerely yours,  
LINDLEY M. GARRISON.

The President replied to this letter with these phrases:

"I am not yet convinced . . . I feel in duty bound to keep my mind open to conviction on that side (the national guard argument). I should deem it a very serious mistake to shut the door against this attempt on the part of the committee with perfect good faith to meet the essentials of the programme set forth in my message but in a way of their own choosing . . . This is a time when it seems to me

patience on the part of all of us is essential . . ." To this letter Mr. Garrison replied, tendering his resignation. He said: "It is evident that we hopelessly disagree upon what I conceive to be fundamental principles. This makes manifest the impropriety of my longer remaining your seeming representative with respect to these matters." The resignation was promptly accepted, as was that of Assistant Secretary of War Henry Breckinridge of Kentucky, who sent in his resignation on the same day in which Mr. Garrison's was received. Mr. Breckinridge was in sympathy with the policies of his chief and expressed himself as unable to serve further in the light of the latter's resignation. Mr. Garrison was succeeded by Newton Diehl Baker of Ohio, March 8, 1916.

There were no other changes in the cabinet of the President during the year.

**SUPREME COURT.** The nomination of Louis D. Brandeis (q.v.) of Boston as Associate Justice of the Supreme Court, made by President Wilson early in February, 1916, to fill the vacancy caused by the death of Justice Joseph R. Lamar (q.v.) was unexpected and was the subject of much comment and not a little opposition, both in Congress and outside, owing chiefly to the prominence of Mr. Brandeis in recent years as an advocate of advanced social legislation, as counsel for working men and women in contests over legislation relating to working hours and wages, as counsel in the Ballinger Conservation episode, and in proceedings before the Interstate Commerce Commission relating to railroad rates. He had also acted as adviser in legislation against trusts. Mr. Brandeis is a leader in the Zionist movement and was the first Jew to be named for the Supreme Court.

Prolonged hearings were held by the judiciary committee of the Senate, and much evidence in relation to Mr. Brandeis's various activities was heard. Several months elapsed before a vote was taken in the Senate, but he was finally confirmed on June 1st by a vote of 47 to 22.

The resignation of Justice Hughes made it necessary to appoint a successor, and on July 14th the President nominated John Hessin Clarke (q.v.), of Cleveland, Ohio. The nomination was confirmed by the Senate on July 24th, and Justice Clarke entered upon the duties of his office on October 9th. The Supreme Court was composed during the year of Edward Douglass White of Louisiana, Chief Justice; Associate Justices, Joseph McKenna of Pennsylvania, O. W. Holmes of Massachusetts, William R. Day of Ohio, Willis Van Devanter of Indiana, Mahlon Pitney of New Jersey, James C. McReynolds of Tennessee, Louis D. Brandeis of Massachusetts, and John Hessin Clarke of Ohio.

**CONGRESS.** *Sixty-fourth Congress.* Congress reassembled after the holiday session on January 4th. On the same day the banking and currency committee reported favorably the rural credits bill. On January 6th, the Senate adopted a resolution calling upon the President for information relating to the stability of the present government in Mexico, and for documents forming the record of the relations of the United States with Mexico within recent years. The committee on sutrage on January 8th favorably reported an amendment to the Constitution providing equal suffrage. On January 12th there was a sharp debate in the Senate on the murder of 19 Ameri-

can mining officials in Mexico. (See MEXICO.) A tariff commission bill was introduced in the House on February 1st. This provided for a non-partisan board of five members to investigate and report on tariff matters. The House on February 2nd adopted the so-called Keating child labor bill prohibiting interstate shipments of the products of child labor. On the same day the House passed the first two of the national defense bills, prepared by the administration. One of these increases the corps of cadets at the Naval Academy by 531, while the other made appropriations for enlarging the facilities for the construction of battleships at the Mare Island and New York navy yards. These measures were passed in the Senate on February 9th. On February 4th the army reorganization bill was introduced in the Senate. (See section *Army*.) Both branches of Congress assembled in joint session on April 19th to listen to an address by President Wilson in regard to the warfare carried on by Germany against vessels of commerce by the use of submarines. (See UNITED STATES AND THE WAR.) On May 1st, the House by a vote of 213 to 165 rejected a bill previously passed in the Senate fixing a definite date for the withdrawal from the Philippine Islands, and substituting the so-called Jones bill, which affirmed the intention of the United States to withdraw from the islands as soon as a stable government could be established. (See PHILIPPINES.) The Senate on May 4th passed the rural credits bill, by a vote of 68 to 5. On May 13th this bill was passed by the House. The Senate on May 8th passed the good roads bill, authorizing the expenditure of \$85,000,000 for over a period of five years. The House committee on naval affairs on May 18th rejected the five-year naval programme, but recommended the construction of five battle cruisers. On May 20th the House passed the administration shipping bill by a strictly party vote. The conference report on the army reorganization bill was adopted by a vote of 349 to 25. On May 24th the Senate committee on judiciary favorably reported the nomination of Louis D. Brandeis to the Supreme Court, after a consideration of four months. The nomination was confirmed by the Senate on June 1st. On June 2nd the House passed the naval appropriation bill carrying approximately \$270,000,000. On July 22nd the naval appropriation bill passed the Senate, carrying the largest amount for such a bill in the history of the country. (See section *Navy*.) The Senate on July 27th passed the army appropriation bill, carrying \$314,000,000, or nearly double the sum authorized in the House bill. On July 29th the Senate by a vote of 46 to 19 adopted a resolution expressing the hope that the British government would exercise clemency in the treatment of Irish prisoners. (See GREAT BRITAIN.) - The Senate on August 8th, after a debate lasting for several days, passed the child labor law, which had already been passed in the House. (See CHILD LABOR.) The House adopted on August 9th the conference report on the army appropriation bill, and on August 15th the House accepted the programme passed by the Senate providing for great increases in naval construction. The Senate on August 16th approved the conference report on the Philippine bill, by drafting the Clarke amendment promising independence in four years. The Demo-



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LOUIS DEMBITZ BRANDEIS  
Of Massachusetts



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JOHN HESSIN CLARKE  
Of Ohio

TWO JUSTICES OF THE UNITED STATES SUPREME COURT APPOINTED IN 1916



cratic members of the finance committee of the Senate on August 17th reported the new revenue bill asked for by the administration. There was asked for in addition to this bill an appropriation of \$130,000,000 to meet the extraordinary expenses due to the Mexican situation. The Senate on August 18th by a vote of 38 to 21 passed the shipping bill, "for the purpose of encouraging, developing, and creating a naval auxiliary, a naval reserve, and a merchant marine." The President on August 18th vetoed the army appropriation bill, objecting to the provision for exempting retired officers from military trial and discipline. This bill was re-passed by both houses with the objectionable provision eliminated, and was signed by the President. On August 19th the Senate passed the workmen's compensation bill providing for allowances, in case of disability, to over 500,000 government employees. In the Senate on August 22nd began the general debate on the emergency revenue bill. Both branches of Congress assembled in the House, and were addressed by the President in regard to the threatened railroad strike. On August 3rd Representative Adamson, chairman of the House committee on interstate commerce, introduced an eight-hour bill, which was acceptable to the President, and to the representatives of the four railroad brotherhoods. This bill was passed by the House on September 1st, by a vote of 239 to 56. Seventy Republicans voted with the Democratic majority, while two Democrats voted against the measure. On September 2nd, the Senate passed without amendment the eight-hour bill by a vote of 43 to 28. Two Democrats voted against the measure, and one Republican for it. Both branches of Congress on September 4th agreed to the conference report on the workmen's compensation bill. The Senate on September 5th by a vote of 43 to 16 passed the emergency revenue bill, designed to raise \$205,000,000 annually in special taxes. Five Republicans voted with the Democrats for this measure. On September 7th both branches adopted the conference report on the special revenue bill, dropping, however, the most drastic of the amendments, which empowered the President to retaliate against belligerent countries which interfere with American rights. On the same day the Senate ratified the treaty with Denmark, providing for the purchase of the Danish West Indies.

The Sixty-fourth Congress adjourned on September 8th. The appropriations made exceeded those of any preceding Congress. For current appropriations and for future expenses the total was \$1,858,384,485. This is over \$750,000,000 more than the total of the last fiscal year. By far the largest item of increase was the large sums appropriated for the reorganization of the army and navy. The Mexican crisis also called for unusual expenditures to provide for the mobilization of the national guard on the American border.

Among the more important measures passed by this Congress were those granting a basic eight-hour day with no reductions of pay to employees of railroads engaged in interstate commerce; the shipping bill appropriation, \$50,000,000, for the purchase and operation of ships by the government; the child labor bill, prohibiting interstate trade in the products of factories where children, under specified age or for long hours,

are employed; the emergency revenue law increasing the Federal income tax and levying a Federal inheritance tax and a profit tax on the munitions of war. A large appropriation was also made for local improvements, especially for the construction of highways. Among the important treaties ratified during the year were those with Nicaragua, providing for the acquisition of a canal route by the United States, and giving that government also naval station rights in the Gulf of Fonseca; the treaty for the purchase of the Danish West Indies; and the treaty providing for the American National Protectorate over the Republic of Haiti.

A striking feature of the revenue resolution was the effort to strengthen the government against foreign interference with American trade and industry. Tariff increases were authorized to meet the "dumping" of foreign goods after the war, which is anticipated. Tariff was increased on dyestuffs, and a tariff commission was created. A provision was added to the revenue bill giving the President power to withhold clearance from vessels of governments which discriminated against any American citizen or firm. This was designed as a reprisal for the black-listing of American firms by the British government.

The short session of the Sixty-fourth Congress convened on December 4th. President Wilson in his address on December 5th to the Congress renewed his recommendation for legislation to prevent a nation-wide railway strike, or lock-out, before there might be opportunity for investigation. He also recommended the passage of a bill providing for the government of Porto Rico, and a corrupt practices bill. The main portion of the address was devoted to the railway question. He reviewed the six proposals made to Congress near the end of the previous session, which related to the railroads of the country, their regulation, and the settlement of disputes over the hours and wages of the employees. Three of these proposals had been already acted upon. Two of these provided for the eight-hour day and created a commission to study its effect in actual operation. The other gave the Interstate Commerce Commission the power to determine the limit of wages. This left three of the proposals to be acted upon. One of these enlarged and reorganized the Interstate Commerce Commission, another authorized the President to take control of the railroad lines, and their equipment for military purposes in case of need. The most important of the recommendations provided for the settlement of disputes over wages and hours of labor arising between the managers and employees of railroads which are engaged in interstate commerce. For further discussion of these questions, see RAILROADS. There were three new members in the Senate: James E. Watson, of Indiana, Republican, elected to fill the vacancy caused by the death of Senator Shively (q.v.), temporarily filled by Thomas Taggart, Democrat; Bert M. Fernald, of Maine, who succeeded Senator E. C. Burleigh (q.v.), deceased; and William F. Kirby, Democrat, of Arkansas, who succeeded Senator J. P. Clark (q.v.), deceased. The election of Senator Watson reduced the Democratic majority in the Senate from 16 to 14. The membership was composed of 55 Democrats and 41 Republicans. Senator Saulsbury of Delaware was chosen president pro tempore and majority

leader, a position which had been filled until his death by Senator Clarke. In the House three new members took seats: Thomas W. Harrison, Democrat, succeeded James Hay of Virginia; Henry C. Woodyard, Republican, of West Virginia, succeeded Representative Moss, deceased; and Henry S. Benedict, Progressive, of California, succeeded Representative Stephens, who resigned to become Lieutenant-Governor of the State. There was a brief consideration in the Senate of the corrupt practices bill, and of proposed amendments, and on December 18th a subcommittee was appointed to redraft the measure and report to the Senate not later than Jan. 3, 1917. Congress adjourned on December 22nd for the Christmas holidays, to reassemble on Jan. 2, 1917.

The membership of the Sixty-fourth Congress is given below:

[Democrats in roman; Republicans in *italics*; Progressives in SMALL CAPS; Progressive Republican in *italics* with \*; Independent in CAPS; Prohibitionist in roman with \*; Socialist in black letter; Progressive-Protectionist in CAPS with \*; Progressive-Democrat in SMALL CAPS with \*.]

ALABAMA.—SENATORS: John H. Bankhead, Oscar W. Underwood. REPRESENTATIVES (Democrats, 10): At large, John W. Abercrombie, Oscar L. Gray, S. Hubert Dent, Jr., Henry B. Steagall, Fred L. Blackmon, J. Thomas Heflin, William B. Oliver, John L. Burnett, Edward B. Almon, George Huddleston.

ARIZONA.—SENATORS: Henry F. Ashurst, Marcus A. Smith. REPRESENTATIVE (Democrat, 1): At large, Carl Hayden.

ARKANSAS.—SENATORS: Joseph T. Robinson, William F. Kirby. REPRESENTATIVES (Democrats, 7): Thaddeus H. Caraway, William A. Oldfield, John N. Tillman, Otis Wingo, Henderson M. Jacoway, Samuel M. Taylor, William S. Goodwin.

CALIFORNIA.—SENATORS: John D. Works, James D. Phelan. REPRESENTATIVES (Democrats, 8; Republicans, 4; Progressives, 2; Independent, 1; Prohibitionist, 1): WILLIAM KENT, John E. Raker, *Charles F. Curry, Julius Kahn, JOHN I. NOLAN, JOHN A. ELSTON, Denver S. Church, Everis A. Hayes, Charles H. Randall,\* H. Stanley Benedict, William Kettner.*

COLORADO.—SENATORS: Charles S. Thomas, John F. Shafroth. REPRESENTATIVES (Democrats, 8; Republican, 1): Benjamin C. Hilliard, *Charles B. Timberlake, Edward Keating, Edward T. Taylor.*

CONNECTICUT.—SENATORS: *Frank B. Brandegee, George P. McLean.* REPRESENTATIVES (Republicans, 5): *P. Davis Oakley, Richard P. Freeman, John Q. Tison, Ebenezer J. Hill, James P. Glynn.*

DELAWARE.—SENATORS: *Henry A. du Pont, Willard Saulsbury.* REPRESENTATIVE (Republican, 1): At large, *Thomas W. Miller.*

FLORIDA.—SENATORS: Duncan U. Fletcher, Nathan P. Bryan. REPRESENTATIVES (Democrats, 4): Stephen M. Sparkman, Frank Clark, Emmett Wilson, William J. Sears.

GEORGIA.—SENATORS: Hoke Smith, Thomas W. Hardwick. REPRESENTATIVES (Democrats, 12): Charles G. Edwards, Frank Park, Charles E. Crisp, William C. Adamson, William S. Howard, James W. Wise, Gordon Lee, Samuel J. Tribble, Thomas M. Bell, Carl Vinson, J. Randall Walker, Dudley M. Hughes.

IDAHO.—SENATORS: *William E. Borah, James H. Brady.* REPRESENTATIVES (Republicans, 2): At large, *Robert M. McCracken, Addison T. Smith.*

ILLINOIS.—SENATORS: Jas. Hamilton Lewis, *Lawrence Y. Sherman.* REPRESENTATIVES (Democrats, 10; Republicans, 16; Progressive Republican, 1): At large, *Burnett M. Chipperfield, Wm. Elza Williams; Martin B. Madden, James R. Mann, William W. Wilson, James T. McDermott, Adolph J. Sabath, James McAndrews, Frank Buchanan, Thomas Gallagher, Fred A. Brütten, George E. Foss, Ira C. Copley,\* Charles E. Fuller, John O. McKenzie, Clyde H. Tavener, Edward J. King, Claudius U. Stone, John A. Sterling, Joseph G. Cannon, William B. McKinley, Henry T. Rainey, Loren E. Wheeler, William A. Rodenberg, Martin D. Foster, Thomas S. Williams, Edward E. Denton.*

INDIANA.—SENATORS: John W. Kern, *James E. Watson.* REPRESENTATIVES (Democrats, 11; Republicans, 2): Charles Lieb, William A. Cullop, William E. Cox, Lincoln Dixon, Ralph W. Moss, Finly H. Gray, *Merrill Moores, John A. M. Adair, Martin A. Morrison, William E. Wood, George W. Rauch, Cyrus Cline, Henry A. Barnhart.*

IOWA.—SENATORS: *Albert B. Cummins, William S.*

*Kenyon.* REPRESENTATIVES (Democrat, 1; Republicans, 10): *Charles A. Kennedy, Harry B. Hull, Burton B. Sweet, Gilbert N. Haugen, James W. Good, C. William Ramseyer, Cassius C. Dowell, Horace M. Towner, William K. Green, Frank P. Woods, T. J. Steele.*

KANSAS.—SENATORS: William H. Thompson, *Charles Curtis.* REPRESENTATIVES (Democrats, 6; Republicans, 2): *Daniel E. Anthony, Jr., Joseph Taggart, Philip P. Campbell, Dudley Doolittle, Guy T. Haverling, John R. Connely, Jonett Shouse, William A. Ayres.*

KENTUCKY.—SENATORS: Ollie M. James, J. O. W. Beckham. REPRESENTATIVES (Democrats, 9; Republicans, 2): Alben W. Barkley, David H. Kincheloe, Robert Y. Thomas, Jr., Ben Johnson, Swager Sherley, Arthur B. Rouse, J. Campbell Cantrill, Harvey Helm, William J. Fields, *John W. Langley, Caleb Powers.*

LOUISIANA.—SENATORS: Joseph E. Ransdell, Robert F. Broussard. REPRESENTATIVES (Democrats, 7; Progressive-Protectionist, 1): Albert Estopinal, H. Garland Dupré, WHITMELL P. MARTIN,\* John T. Watkins, Riley J. Wilson, Lewis L. Morgan, Ladislav Lazaro, James B. Aswell.

MAINE.—SENATORS: Charles F. Johnson, *Bert M. Fernald.* REPRESENTATIVES (Democrat, 1; Republicans, 3): *Asher C. Hinds, Daniel J. McGillicuddy, John A. Peters, Frank E. Guernsey.*

MARYLAND.—SENATORS: John Walter Smith, Blair Lee. REPRESENTATIVES (Democrats, 5; Republican, 1): Jesse D. Price, J. Fred C. Talbot, Charles P. Coady, J. Charles Linticum, *Sydney E. Mudd, David J. Lewis.*

MASSACHUSETTS.—SENATORS: *Henry Cabot Lodge, John W. Weeks.* REPRESENTATIVES (Democrats, 4; Republicans, 12): *Allen T. Treadway, Frederick H. Gillett, Calvin D. Paigo, Samuel E. Winslow, John Jacob Rogers, Augustus P. Gardner, Michael F. Phelan, Frederick W. Dallinger, Ernest W. Roberts, Peter F. Tague, George Holden Tenham, James A. Gallivan, William H. Carter, Richard Olney, 2nd, William S. Greene, Joseph Walsh.*

MICHIGAN.—SENATORS: *William Alden Smith, Charles E. Townsend.* REPRESENTATIVES (Democrats, 2; Republicans, 11): Frank E. Doremus, Samuel W. Beakes, J. M. C. Smith, *Edward L. Hamilton, Carl E. Mapes, Patrick H. Kelley, Louis C. Cramton, Joseph W. Fordney, James C. McLaughlin, George A. Loud, Frank D. Scott, W. Frank James, Charles A. Nichols.*

MINNESOTA.—SENATORS: *Knute Nelson, Moses E. Olapp.* REPRESENTATIVES (Democrat, 1; Republicans, 8; Progressive, 1): *Sydney Anderson, Franklin F. Ellsworth, Charles E. Davis, Carl C. Van Dyke, George E. Smith, Charles A. Lindbergh, Andrew J. Volstead, Clarence B. Miller, Halvor Steenserson, THOMAS D. SCHALL.*

MISSISSIPPI.—SENATORS: John Sharp Williams, James K. Vardaman. REPRESENTATIVES (Democrats, 8): Ezekiel S. Candler, Jr., Hubert D. Stephens, Benjamin G. Humphreys, Thomas U. Sisson, William W. Venable, Pat Harrison, Percy E. Quin, James W. Collier.

MISSOURI.—SENATORS: William J. Stone, James A. Reed. REPRESENTATIVES (Democrats, 14; Republicans, 2): James T. Lloyd, William W. Hucker, Joshua W. Alexander, Charles F. Booher, William P. Borland, Clement C. Dickinson, Courtney W. Hamlin, Dorsey W. Shackelford, Champ Clark, *Jacob E. Meeker, William L. Igoe, Leonidas C. Dyer, Walter L. Hensley, Joseph J. Russell, Perl D. Decker, Thomas L. Rubey.*

MONTANA.—SENATORS: Henry L. Myers, Thomas J. Walsh. REPRESENTATIVES (Democrats, 2): At large, John M. Evans, Tom Stout.

NEBRASKA.—SENATORS: Gilbert M. Hitchcock, *George W. Norris.* REPRESENTATIVES (Democrats, 8; Republicans, 8): *O. F. Reavis, Charles O. Lobeck, Dan V. Stephens, Charles H. Sloan, Ashton C. Shallenberger, Moses P. Kinkaid.*

NEVADA.—SENATORS: Francis G. Newlands, Key Pittman. REPRESENTATIVE (Republican, 1): At large, *E. E. Roberts.*

NEW HAMPSHIRE.—SENATORS: *Jacob H. Gallinger, Henry F. Hollis.* REPRESENTATIVES (Republicans, 2): *Cyrus A. Sulloway, Edward H. Wason.*

NEW JERSEY.—SENATORS: James E. Martine, William Hughes. REPRESENTATIVES (Democrats, 4; Republicans, 8): *William J. Browning, Isaac Beachers, Thomas J. Scully, Elijah C. Hutchinson, John H. Coptstick, Archibald O. Hart, Dow H. Drucker, Edward W. Gray, Richard Wayne Parker, Frederick E. Leshbach, John J. Egan, James A. Hamill.*

NEW MEXICO.—SENATORS: *Thomas B. Catron, Albert B. Fall.* REPRESENTATIVE (Republican, 1): At large, *Benigno O. Hernandez.*

NEW YORK.—SENATORS: James A. O'Gorman, *James W. Wadsworth, Jr.* REPRESENTATIVES (Democrats, 18; Republicans, 24; Socialist, 1): *Frederick C. Hicks, Charles P. Caldwell, Joseph V. Flynn, Harry H. Dale, James P. Maher, Frederick W. Rows, John J. Fitzgerald, Daniel J. Griffin, Oscar Wm. Sulfit, Beulah L. Haskell, Daniel J. Riordan, Meyer London, George W.*





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North Carolina



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California



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**HENRY CABOT LODGE**  
Massachusetts

**FOUR UNITED STATES SENATORS PROMINENT IN 1916**



Loft, Michael F. Farley, Michael F. Conry, Peter J. Dooling, John F. Carew, Thomas G. Patton, Walter M. Chandler, Isaac Siegel, Murray Hulbert, Henry Bruckner, William S. Bennet, Woodson R. Oglesby, James W. Husted, Edmund Platt, Charles B. Ward, Rollin B. Sanford, James S. Parker, William B. Charles, Bertrand H. Snell, Luther W. Mott, Homer P. Snyder, George W. Fairchild, Walter W. Magee, Norman J. Gould, Harry H. Pratt, Thomas B. Dunn, Henry G. Danforth, S. Wallace Dempsey, Charles B. Smith, Daniel A. Driscoll, Charles M. Hamilton.

**NORTH CAROLINA.**—SENATORS: F. M. Simmons, Lee S. Overman. REPRESENTATIVES (Democrats, 9; Republican, 1): John H. Small, Claude Kitchin, George E. Hood, Edward W. Pou, Charles M. Stedman, Hannibal L. Godwin, Robert N. Page, Robert L. Doughton, Edwin Y. Webb, James J. Britt.

**NORTH DAKOTA.**—SENATORS: Porter J. McCumber, Asie J. Gronna. REPRESENTATIVES (Republicans, 3): Henry T. Helgesen, George M. Young, Patrick D. Norton.

**OHIO.**—SENATORS: Atlee Pomeroy, Warren G. Harding. REPRESENTATIVES (Democrats, 9; Republicans, 18): Nicholas Longworth, Alfred G. Allen, Warren Gard, J. Edward Russell, Nelson E. Mathews, Charles O. Keams, Simon D. Fass, John A. Kay, Isaac E. Sherwood, Robert M. Switzer, Edwin D. Rickette, Clement Brumbaugh, Arthur W. Overmyer, Seward E. Williams, William C. Mooney, Roscoe C. McCulloch, William A. Ashbrook, David A. Hollmerworth, John G. Cooper, William Gordon, Robert Crosser, Henry I. Emerson.

**OKLAHOMA.**—SENATORS: Thomas P. Gore, Robert L. Owen. REPRESENTATIVES (Democrats, 7; Republican, 1): James S. Davenport, William W. Hastings, Charles D. Carter, William H. Murray, Joseph B. Thompson, Scott Ferris, James V. McClintic, Dick T. Morgan.

**OREGON.**—SENATORS: George E. Chamberlain, Harry Lane. REPRESENTATIVES (Republicans, 8): Willis O. Hawley, Nicholas J. Sinnott, O. N. McArthur.

**PENNSYLVANIA.**—SENATORS: Boies Penrose, George T. Oliver. REPRESENTATIVES (Democrats, 6; Republicans, 30): At large, Thomas S. Orago, Mahlon M. Garland, Daniel F. Lufsan, John E. K. Scott, William S. Vane, George S. Graham, J. Hampton Moore, George W. Edmonds, Peter E. Costello, George P. Darrow, Thomas S. Butler, Henry W. Watson, William W. Griset, John R. Farr, John J. Casey, Robert D. Heaton, Arthur G. Dewalt, Louis T. McPadden, Edgar R. Kees, John V. Lesher, Benjamin K. Focht, Aaron S. Kreider, Warren W. Bailey, C. William Beales, Charles H. Rowland, Abraham L. Keister, Robert F. Hopwood, Henry W. Temple, Michael Liebel, Jr., Henry J. Steele, S. Taylor North, Samuel H. Miller, Stephen G. Porter, William H. Coleman, John M. Morin, Andrew J. Barschfeld.

**RHODE ISLAND.**—SENATORS: Henry F. Lippitt, LeBaron B. Colt. REPRESENTATIVES (Democrat, 1; Republicans, 2): George F. O'Shaunessy, Walter E. Sitness, Ambrose Kennedy.

**SOUTH CAROLINA.**—SENATORS: Benjamin R. Tillman, Ellison D. Smith. REPRESENTATIVES (Democrats, 7): Richard S. Whaley, James F. Byrnes, Wyatt Aiken, Samuel J. Nicholls, David E. Finley, J. Willard Ragdale, Asbury F. Lever.

**SOUTH DAKOTA.**—SENATORS: Thomas Sterling, Edwin S. Johnson. REPRESENTATIVES (Democrat, 1; Republicans, 2): Charles H. Dillon, Royal O. Johnson, Harry L. Gandy.

**TENNESSEE.**—SENATORS: Luke Lea, John K. Shields. REPRESENTATIVES (Democrats, 8; Republicans, 2): Sam E. Sells, Richard W. Austin, John A. Moon, Cordell Hull, William O. Houston, Joseph W. Byrns, Lemuel P. Padgett, Thetus W. Sims, Finis J. Garrett, Kenneth D. McKellar.

**TEXAS.**—SENATORS: Charles A. Culberson, Morris Sheppard. REPRESENTATIVES (Democrats, 18): At large, Jeff. McLemore, James H. Davis; Eugene Black, Martin Dies, James Young, Sam Rayburn, Hatton W. Sumners, Rufus Hardy, Alexander W. Gregg, Joe H. Eagle, George F. Burgess, James P. Buchanan, Robert L. Henry, Oscar Callaway, John H. Stephens, James L. Slayden, John N. Garner, William E. Smith.

**UTAH.**—SENATORS: Reed Smoot, George Sutherland. REPRESENTATIVES (Republican, 1; Progressive Democrat, 1): Joseph Howell, JAMES H. MAYS.\*

**VERMONT.**—SENATORS: William P. Dillingham, Carroll S. Page. REPRESENTATIVES (Republicans, 2): Frank L. Greene, Porter H. Dale.

**VIRGINIA.**—SENATORS: Thomas S. Martin, Claude A. Swanson. REPRESENTATIVES (Democrats, 9; Republican, 1): William A. Jones, Edward E. Holland, Andrew J. Montague, Walter A. Watson, Edward W. Saunders, Carter Glass, T. W. Harrison, Charles C. Carlin, C. Bascom Slemm, Henry D. Flood.

**WASHINGTON.**—SENATORS: Wesley L. Jones, Miles Poindexter. REPRESENTATIVES (Democrat, 1; Republicans, 4): William E. Humphrey, Lindley H. Y. B. 16—24.

Hadley, Albert Johnson, William L. La Follette, O. O. Dill.

**WEST VIRGINIA.**—SENATORS: William E. Chilton, Nathan Goff. REPRESENTATIVES (Democrats, 2; Republicans, 4): At large, Howard Sutherland; M. M. Neely, George M. Bowers, Adam B. Littlepage, Harry C. Woodyard, Edward Cooper.

**WISCONSIN.**—SENATORS: Robert M. La Follette, Paul O. Husting. REPRESENTATIVES (Democrats, 3; Republicans, 8): Henry A. Cooper, Michael E. Burke, John M. Nelson, William J. Cary, William H. Stafford, Michael K. Reilly, John J. Esch, Edward E. Browne, Thomas F. Konop, James A. Frear, Irvin L. Lenroot.

**WYOMING.**—SENATORS: Clarence D. Clark, Francis E. Warren. REPRESENTATIVE (Republican, 1): At large, Frank W. Mondell.

**ALASKA.**—James Wickersham (Delegate).  
**HAWAII.**—J. Kuhiu Kalaniana'ole (Delegate).

**PHILIPPINES.**—Manuel L. Quezon, Manuel Earnshaw (Resident Commissioners).

**PORTO RICO.**—(Resident Commissioner: vacancy.)

CLASSIFICATION

SENATE	HOUSE
Democrats . . . . . 55	Democrats . . . . . 227
Republicans . . . . . 41	Republicans . . . . . 199
	Progressives . . . . . 8
Total . . . . . 96	Progressive Republican 1
	Independent . . . . . 1
	Socialist . . . . . 1
	Prohibitionist . . . . . 1
	Prog.-Protectionist . . . 1
	Prog.-Democrat . . . . . 1
	Total . . . . . 435

*Sixty-fifth Congress.* Revised figures as to the result of the election in the House of Representatives show that it will be composed of 214 Republicans, 213 Democrats, 2 Independents, 2 Progressives, 1 Prohibitionist, 1 Socialist, with 2 seats contested. Thus members of independent parties will have the controlling vote of the House. Contests in which certificates have not been issued were in the 32nd Pennsylvania district, and the 3rd New Jersey district. The Senate, as a result of the November elections, remains Democratic, with a majority of 12 instead of 14 as in the Sixty-fourth Congress. Republican Senators succeeded Democrats in California, Indiana (2), Maryland, New Jersey, New York, and West Virginia. Democrats succeeded Republicans in Delaware, New Mexico, Rhode Island, Utah, and Wyoming. The following is a list of the members of the Senate as it will be constituted in the Sixty-fifth Congress:

- Alabama.—John H. Bankhead and Oscar W. Underwood.
- Arizona.—Henry F. Ashurst and Marcus A. Smith.
- Arkansas.—Joseph T. Robinson and William F. Kirby.
- California.—James D. Phelan and Hiram W. Johnson.
- Colorado.—Charles S. Thomas and John F. Shafroth.
- Connecticut.—Frank B. Brandegee and George P. McLean.
- Delaware.—Willard Saulsbury and J. O. Wolcott.
- Florida.—Duncan U. Fletcher and Park Trammell.
- Georgia.—Hoke Smith and Thomas W. Hardwick.
- Idaho.—William E. Borah and James H. Brady.
- Illinois.—J. Hamilton Lewis and Lawrence Y. Sherman.
- Indiana.—James E. Watson and Harry S. New.
- Iowa.—Albert B. Cummins and William S. Kenyon.
- Kansas.—William H. Thompson and Charles Curtis.
- Kentucky.—Ollie M. James and J. C. W. Beckham.
- Louisiana.—Joseph E. Ransdell and Robert F. Brunsard.
- Maine.—Bert M. Fernald and Frederick Hale.
- Maryland.—John Walter Smith and J. I. France.
- Massachusetts.—Henry Cabot Lodge and John W. Weeks.
- Michigan.—William Alden Smith and Charles E. Townsend.
- Minnesota.—Knute Nelson and Frank B. Kellogg.
- Mississippi.—John Sharp Williams and James K. Vardaman.
- Missouri.—William J. Stone and James A. Reed.
- Montana.—Henry L. Myers and Thomas J. Walsh.
- Nebraska.—Gilbert M. Hitchcock and George W. Norris.

Nevada.—Francis G. Newlands and Key Pittman.  
 New Hampshire.—Jacob H. Gallinger and Henry F. Hollis.  
 New Jersey.—William Hughes and Joseph S. Frelinghuysen.  
 New Mexico.—Albert B. Fall and A. A. Jones.  
 New York.—James W. Wadsworth, Jr., and William M. Calder.  
 North Carolina.—F. M. Simmons and Lee S. Overman.  
 North Dakota.—Porter J. McCumber and Asa J. Gronna.  
 Ohio.—Atlee Pomerene and Warren G. Harding.  
 Oklahoma.—Thomas P. Gore and Robert L. Owen.  
 Oregon.—George E. Chamberlain and Harry Lane.  
 Pennsylvania.—Boies Penrose and Philander C. Knox.  
 Rhode Island.—LeBaron B. Colt and Peter Goelet Gerry.  
 South Carolina.—Benjamin R. Tillman and Ellison D. Smith.  
 South Dakota.—Thomas Sterling and Edwin S. Johnson.  
 Tennessee.—John K. Shields and Kenneth D. McKellar.  
 Texas.—Charles A. Culberson and Morris Sheppard.  
 Utah.—Reed Smoot and William H. King.  
 Vermont.—William P. Dillingham and Carroll S. Page.  
 Virginia.—Thomas S. Martin and Claude A. Swanson.  
 Washington.—Wesley L. Jones and Miles Poindexter.  
 West Virginia.—Nathan Goff and Howard Sutherland.  
 Wisconsin.—Robert M. La Follette and Paul O. Husting.  
 Wyoming.—Francis E. Warren and John B. Kendrick.

**ADMINISTRATION.** The history of the administration in its larger aspect is told in articles dealing with domestic and foreign relations of the United States and the presidential campaign. (See MEXICO, UNITED STATES AND THE WAR, and the sections in this article *Congress, Presidential Campaign*, etc.) In this section there will be treated only such phases of the administration as do not properly come under other heads.

President Wilson began on January 27th, in New York City, a series of public addresses relating chiefly to plans for national defense. These speeches were delivered in a measure on account of the defense programme in Congress, where action had been delayed and plans for new taxes, to raise money for defense purposes, had encountered strong opposition. In his first address delivered before the Railroad Business Men's Association in New York, he declared that the question of national defense had been clouded by passion and prejudice. He said that partisan feeling should be excluded and that in dealing with the question all parties should be drawn together. He said that while the passion of the people was for peace and he had sought to maintain peace, against very great and sometimes very unfair odds, the American people would fight for the vindication of their life and character, for liberty, and their free institutions. He declared that America must maintain her sovereignty, and that she had become the champion of free government throughout the western hemisphere. As to methods, he had in mind the development of a system of industrial and vocational education, under Federal guidance, to which could be added training in the use of arms, camp sanitation, and military discipline, to make men serviceable for national defense. Such a system, he said, could not be made in a short time. Training should be given to a sufficient body of citizens without delay. While he admired and respected the national guard, it had the disadvantage of being under the control of the States, and the President could command it only in the case of actual invasion. There should be, he said, a citizens' reserve of at least

500,000 trained men, to be available in case of necessity.

Two days after his New York speech the President spoke in Pittsburgh, where he again advocated the reserve of 500,000 men. In an address made in Cleveland he said that the administration had not found it easy to avoid entanglements. Here he urged the development of coast defenses, enlargement of the navy, and again the supplementing of the army by a trained reserve. He said with great emphasis: "Let me tell you very solemnly that you cannot afford to postpone this thing. I do not know what a single day may bring forth."

In the speech delivered in Chicago the President touched upon the Monroe Doctrine. He said: "We are not asking ourselves 'Shall we be prepared to defend our own shores, and our own homes?' Is that all we stand for? To keep the doors securely shut against enemies? What about the great principles that we have stood for—for liberty of government, and national independence in the whole Western Hemisphere?"

At St. Louis he specified what some of the belligerents "might feel constrained to do." He said: "One reckless commander of a submarine, choosing to put his private interpretation upon what his government wishes him to do, might set the world on fire." He declared that the United States might have to fight to save American lives, but that it ought never to fight to avenge lives already taken, nor should it fight simply to save property.

The three arguments advanced by the President in this series of speeches were, first, the maintenance of the honor of the United States; second, the maintenance of the Monroe Doctrine; third, readiness in case the nation was forced into war. The President returned to Washington on February 4th, after having made 10 speeches in public halls and having made short addresses from the platform of his train. His reception for the most part was enthusiastic. In addition to the cities already mentioned, he spoke in Milwaukee, Des Moines, Topeka, Kansas City, and other cities.

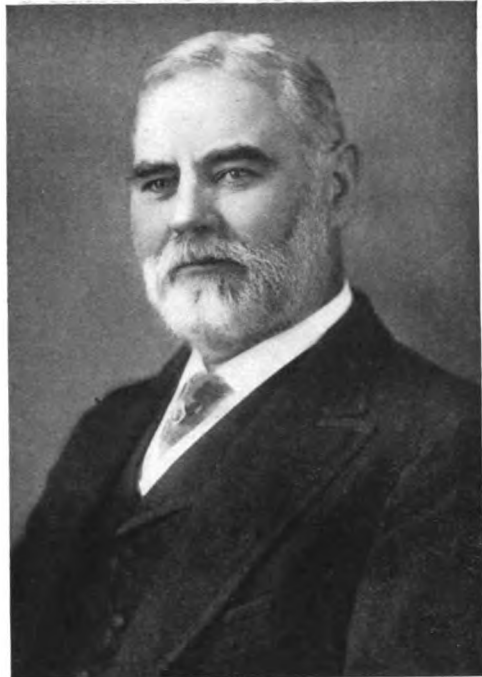
**TREATIES.** A number of important treaties were concluded during the year. These were chiefly with South and Central American countries.

In January President Wilson through Secretary Lansing laid before the Latin-American ambassadors and ministers, to be submitted to their governments, the plan of a general treaty or series of treaties in which the United States and all the other nations of the hemisphere should agree to guarantee the territorial integrity of the several countries; to maintain the republican form of government; to submit to settlement by diplomacy, arbitration, or investigating commissions, disputes of all kinds, boundary disagreements included, but excepting controversies affecting national independence; to prohibit exports of arms to any but the legally constituted governments, and to enact neutrality laws that would prevent filibustering expeditions from starting or carrying on revolutions in neighboring republics.

Treaties with Colombia and Nicaragua, which had been awaiting action by the Senate for two years, received favorable reports by the Senate committee on foreign relations early in February. By the terms of the treaty with Colombia



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Massachusetts

FOUR UNITED STATES REPRESENTATIVES PROMINENT IN 1918



the United States is to pay \$25,000,000, with an expression of regret that anything had occurred to disturb the relations between the two countries. Before the favorable report was ordered the sum to be paid was reduced to \$15,000,000 and expression of regret was made a mutual one in the following words:

"The Government of the United States and the Republic of Colombia in their own names, and in the names of their respective peoples, wishing to have put an end to controversies and differences between them, arising out of the events from which the present situation on the Isthmus of Panama resulted, express sincere regret that anything should have occurred to interrupt or to mar the relations of cordial friendship that had so long subsisted between the two governments."

The treaty with Nicaragua provided that the United States should pay \$3,000,000, receiving in return the exclusive right to make a canal on the Nicaragua route, three small islands, and a naval base on the Gulf of Fonseca.

The Senate on February 18th, by a vote of 55 to 18, ratified the treaty with Nicaragua. Among other provisions this treaty gives the United States "the unencumbered exclusive right, necessary and convenient, to the construction, operation, and maintenance of an inter-oceanic canal by way of the San Juan River and the Great Lake of Nicaragua or by way of any other route over Nicaraguan territory," together with the 99 year lease holding, which may be renewed, of Great Corn Island, and Little Corn Island, in the Caribbean Sea, east of the Nicaraguan coast, and a naval base on the Gulf of Fonseca to be selected by the United States. For this Nicaragua is to be paid the compensation of \$3,000,000 to be spent under the supervision of the United States in payment of the debts of that country, or for other public use. The United States government is to choose the banks where the money is to be deposited, and disbursements are to be made only with the approval of the Secretary of State or his appointee. In order to meet the objections of Costa Rica, Salvador, and Honduras to various provisions of the treaty, the ratification resolution contained a proviso expressly declaring that nothing in the treaty was "to affect any existing right" of the three states.

The Senate on February 28th ratified a treaty with Haiti. By the terms of this treaty the United States formally assumes responsibility for the maintenance of the financial integrity and civil order of the Republic of Haiti, and will exercise over the western third of the island practically the same oversight as had been exercised during the past eight years over the Dominican Republic, which comprises the remainder of the territory of the island. The treaty was modified in certain points in order not to offend the pride of the Haitian people. It calls for cooperation rather than dictation on the part of the United States government. The United States also voluntarily withdrew the demand for Mole St. Nicholas as a naval station. The republic is to be policed by a native constabulary. This will first be under American officers, but these are to be replaced by native officers as soon as they are qualified. An American financial adviser will control the collection of the revenue and its expenditure and prevent the republic from incurring further debt.

All customs duties on exports and imports are to be collected by a general receiver, nominated by the President of the United States and appointed by the President of Haiti. There will also be a financial adviser, who shall devise an adequate system of public accounting, aid the increasing of revenues, inquire into the validity of the debts of Haiti, and take other action in association with the Minister of Finance for the republic's welfare and prosperity. The debts of the republic are to be classified showing the sinking fund required for a final discharge of them. The sums thus raised are to be used first for the payment of the salaries and expenses of the general receiver and the financial adviser and their assistants; second, for the interest and sinking fund of the public debt; third, for the maintenance of the constabulary; and fourth, for the current expenses of the government. The government of Haiti agrees not to increase its present debt without the consent of the President of the United States, or to contract any debt unless surplus revenue is sufficient to pay interest and provide a sinking fund. Haiti also agrees that she will not without the consent of the President of the United States modify the customs duties in such a manner that the revenue will be reduced. Haiti agrees also not to surrender any part of her territory by sale or lease to any foreign power, and not to make any treaties with any power that shall impair her independence. All foreign claims against Haiti are to be settled by arbitration under the agreement by the United States. Sanitary improvements are to be made under the direction of an engineer nominated by the President of the United States. In case of possible intervention the United States pledges itself to lend sufficient aid for the preservation of Haitian independence and the maintenance of a government adequate for the protection of life, property, and individual liberty. The term of the agreement is to be 10 years, but 10 years more may be added "if for specific reasons presented by either high contracting party the purpose of this treaty has not been fully achieved."

An arbitration treaty between the United States and Honduras similar to those negotiated by former Secretary Bryan with many countries, was signed on July 27th at the State Department at Washington. This was the 31st of these treaties to be consummated.

FOREIGN RELATIONS. The most important issues of the United States with foreign countries are discussed elsewhere in this volume, especially in the articles on MEXICO and UNITED STATES AND THE WAR. A number of treaties were ratified during the year, and these will be found discussed in the section *Treaties*. Aside from Mexico and the belligerents in Europe there were few incidents of importance in the relations of the United States with other countries. An exception to this statement was the purchase of the Danish West Indies for \$25,000,000. A strike of native agricultural laborers in these islands in the early part of the year directed the attention of the Danish government to a possible sale of them to the United States. This project had been considered in previous years, but nothing material had been developed. Negotiations between the two countries were taken up and were practically completed on July 23rd. On August 4th a treaty was signed by Secretary

Lansing and the Danish minister, by the terms of which the United States would obtain from Denmark full possession of the islands of St. Thomas, St. John, and St. Croix on the payment of \$25,000,000. The object of obtaining these islands was primarily the establishing of a coaling and cable station at St. Thomas. The Danish lower house of Parliament voted in favor of the selling of the islands, if a vote of the people favored the sale. The upper house on August 15th appointed a committee of 15 members to consider the matter of the sale. On August 24th a resolution was passed by this body to the effect that the question should be settled by general election. On September 5th a report from the Foreign Relations Committee of the Senate recommended the purchase of the islands, and this was ratified on the following day. An amendment to reduce the purchase price to \$10,000,000 was defeated. On December 14th a plebiscite on the question of the sale of these islands to the United States resulted in 283,000 votes being cast in favor of the sale, and 157,000 against such action. The lower house of the Danish Parliament on December 20th adopted the bill ratifying the treaty. The upper house on the following day adopted the bill and on December 22nd it was ratified by the King. This practically completed the negotiations and made the islands the property of the United States. There remained only the formalities for the completion of the transaction. The United States had relations of various sorts with the Central and South American countries. Early in March a section of the Liberal party of Panama made a formal request to President Wilson for the supervision of the Panama presidential election in July by the United States, and this the government undertook to do.

The United States marines participated in an attempt to restore order and preserve peace in the republics of Haiti and Santo Domingo. Troubles in Haiti which began in 1915 were so quieted that it was found possible to withdraw a large part of the force in May, and to transfer it to the Dominican Republic, where a revolution had broken out. This force remained in Santo Domingo for the remainder of the year. Owing to conditions resulting in the interior it was necessary in June to send a column to Santiago and other towns in that vicinity. Somewhat serious resistance on the part of the revolutionists was made at several points. The strongest opposition was encountered at Las Trechernas, a strongly fortified place. The action lasted about three-quarters of an hour, and infantry and machine guns participated. The infantry captured the first line of the trenches at the point of the bayonet, and the revolutionists retired to the second line, out of which they were easily driven. In this engagement one private was killed and four others wounded. The American forces continued to advance through the country, and their progress was marked by frequent skirmishes and resulted in a favorable engagement at Bona Antonio Alta, in which one private was killed. On June 30th, communication was cut with Monte Cristi, and the expeditionary forces moved out as a flying column until communication could be established with Puerto Plata by rail. On July 3rd there was another encounter at the town of Guayacanas. A non-commissioned officer was badly injured. With the arrival of reinforcements the revolu-

tionist fire was held in check and the infantry charged and occupied the trenches. Military operations continued to be carried on until a peace agreement was arrived at between the provisional government and the leader of the revolution. Further trouble ensued, however, and on October 24th there was another engagement between American troops and rebel forces. This resulted from an attempt of the American committee to arrest Vitasta, leader of the revolutionists. Fighting continued for a considerable time, but the rebels eventually were defeated. The engagement occurred opposite Santo Domingo city. In November, under instructions from Washington based upon the reports of conditions in the republic, martial law was established by the American naval and marine force. It was explained that it became necessary to proclaim martial law and set up a military government in Santo Domingo to enable the Dominican government to pay the interest on its foreign debt, in accordance with the treaty of 1907 between the United States and the Dominican Republic, under which the customs receipts of that country were to be collected by an American receiver-general of customs, and disbursed in accordance with the terms of the agreement. The reports from the American commander, Captain Knapp, showed that on account of the political situation the revenues collected by the American receiver-general tied up there could not be disbursed. Under the proclamation Captain Knapp became military governor of the island. There was some opposition to the American administration but no actual hostilities had broken out at the end of the year. There were no relations of moment with Oriental countries. On August 3rd a proposed loan by American bankers to China failed on account of differences of opinion in regard to guarantee. The State Department announced on September 14th that both Japan and Russia had given assurances that the new Russo-Japanese convention was in no wise designed to modify the "open door" in China.

**PRESIDENTIAL CAMPAIGN.** The annals of the political history of the country contain the record of no more remarkable political campaign than that which resulted in the reelection of Woodrow Wilson to the presidency. While there was lacking the tumult and bitterness of the campaign of 1912, the campaign of 1916 had its dramatic moments, and culminated in a climax which has no parallel in the history of American politics.

The Republican party had for its great problem the defeat of President Wilson, by bringing about a reunion of the discordant elements which in 1912 disrupted that great party, and resulted in the election of Mr. Wilson by a minority. The problem of the Democratic party was to retain the votes cast for Mr. Wilson in 1912, and to add to them a sufficient number to overcome the votes which might be added to the Republican vote cast in 1912, plus the votes of those Progressives who should return to the ranks of their old party. It was necessary also to the success of President Wilson to prevent as far as possible a withdrawal from his party of those who found dissatisfaction with his foreign policies, as relating to the European war and to Mexico, and with his domestic policies. It may be said that in a measure both parties succeeded in these great objects. The



union of the Republican and Progressive parties was so complete that but for local disturbances in two of the States, California and Ohio, Mr. Hughes would have been elected. In the other States with one or two exceptions, where the Republican party had been torn asunder in 1912, it was reunited with the Progressive to such an extent that normal Republican majorities were given. Mr. Wilson succeeded in holding the votes cast in 1912, and adding to them the electoral votes of States hitherto Republican or Progressive, which gave to him the small margin of victory which was sufficient.

With one exception the election was the closest ever held. It took weeks to decide whether Hughes or Wilson should be the next President, and the final issue depended on less than 4000 votes. States whose votes were regarded as essential to the victory of one party or the other proved to be non-essential, and the election was finally decided where the voters had been conceded to the Republicans.

Although there was no absence of great issues in the campaign it became towards its end a campaign of personality rather than of party issues. It was the personal acts of President Wilson that were chiefly assailed by the Republican speakers, and the Democrats, in turn, directed their assaults chiefly upon the personality of Mr. Hughes.

The participation of Colonel Roosevelt on the Republican side was another notable feature of the campaign. He fought with his accustomed fire for the election of Mr. Hughes, and there was at no time a question of the loyalty and the wholeheartedness of his support. Mr. Bryan, although he participated in the campaign by making addresses in different parts of the country, was not one of the prominent figures.

The history of the campaign in detail will be narrated in the following main divisions:

- I. THE PRE-CONVENTION CAMPAIGNS.
- II. THE CONVENTIONS.
- III. THE POST-CONVENTION CAMPAIGN.
- IV. THE RESULTS OF THE ELECTION.

#### I. THE PRE-CONVENTION CAMPAIGNS.

**REPUBLICAN PRE-CONVENTION CAMPAIGN.** At the beginning of 1916 three prominent Republicans were mentioned as possible candidates for the Presidency, Theodore Roosevelt, Elihu Root, and Justice Charles E. Hughes. Colonel Roosevelt was the choice of those who saw in his nomination the only hope of reuniting the Republican and Progressive parties, without which reunion there could be no possible hope of defeating President Wilson. Mr. Root represented the choice of those conservative members of the Republican party who wished to maintain the existence of the party along the same lines as had distinguished it prior to 1912. Mr. Hughes was regarded as a compromise candidate. Although he was well known from his career as Governor of New York State, where he had shown remarkable qualities of administration, his attitude toward national policies was unknown, and continued to be unknown until his actual nomination by the convention. There were other candidates frequently mentioned at this time, for the most part men who, while remaining in the Republican party, were strongly identified with the progressive wing of the party.

These included Senator Cummins of Iowa and Senator Borah of Idaho. Other candidates were also spoken of, belonging both to the conservative and to the progressive wings of the party. These included former Senator Burton of Iowa, Henry Ford of Michigan, Senator Sherman of Illinois, and others. At no time did these men acquire more than a passing mention as possibilities, although several of them were candidates in the presidential primary which took place in several of the States.

The chief opposition to the nomination of Mr. Roosevelt centred among those identified with the Republican party in 1912, that is, a conservative element. He was also distrusted by those who feared his possible action in the case of his election, in regard to the war in Europe. His sympathies with the Allies were well known, and he had frequently expressed his resentment toward Germany, and had not hesitated to criticize President Wilson for his failure to present a more aggressive policy toward the Central Powers of Europe and toward Mexico.

Mr. Root, formerly United States Senator from New York, was recognized as one of the most able statesmen of the Republican party. His experience as Secretary of War, Secretary of State, and Senator from New York, together with his natural abilities, made him a conspicuous figure. He was, however, identified to a large extent with the conservative element of the party, and had frequently led the opposition in the Senate against measures advocated by the progressive wing. In the mind of many he was too strongly identified with the so-called "money interests" of the country. From the standpoint of his knowledge of international law and his experience in the handling of foreign relations, it was considered by many that he would be an ideal President in the light of complications which at that time presented themselves on both sides in the European war. It was recognized in the early stage of the campaign, however, that to nominate Mr. Root would be impossible.

Mr. Hughes occupied a peculiar position. He had taken no active part in politics since his appointment to the Supreme Court, and efforts to draw from him any statement in regard to his attitude on the political questions were in vain. Those who advocated his nomination therefore promised nothing, except what could be assumed from his performances as Governor of New York, and from a general knowledge of his characteristics and opinions. The so-called Old Guard of the Republican party did not view his nomination with enthusiasm. Colonel Roosevelt was the only other man whose nomination they feared more.

These in general were the conditions of the Republican party which prevailed at the beginning of the year. The first important utterance in the campaign was delivered at an unofficial convention of the New York Republicans held on February 15th in New York City. This was a speech delivered at that time by Mr. Root. As it was considered to be a "keynote" of the campaign, and contained in effect most of the arguments against Mr. Wilson's policies emphasized in the speeches later in the campaign, it is given at length here.

The address was in effect a powerful arraignment of the administration of President Wilson in the conduct of both domestic and foreign af-

fares. In relation to the responsibility of the President in the conduct of foreign affairs Mr. Root said: "When a President and Secretary of State have been lawfully established in office a power of initiative in foreign affairs rests with them. The nation is in their hands. Theirs the authority and theirs the duty to adopt and act upon policies subject to such laws as Congress may enact within constitutional limits. Parliamentary opposition can take no affirmative step, nor accomplish any affirmative action. The expression of public opinion can do nothing, except as it produces an influence upon the minds of those officers who have the lawful power to conduct our foreign relations."

In regard to conditions in Mexico and the rights of the United States in that country he said: "The United States had rights and duties in Mexico. More than 40,000 of its citizens had sought their fortunes and made their homes there. Thousands of millions of American capital had been invested in that rich and productive country, and millions of income from these enterprises were annually returned to the United States, not merely for the benefit of our whole country, but for its production and enterprise. But revolution had come and factional warfare was ripe. Americans had been murdered, American property had been wantonly destroyed. The lives of all Americans in Mexico were in danger.

"That was the situation when Mr. Wilson became President in March, 1913. His duty then was plain. It was first to use his powers as President to secure protection for the lives and property of Americans in Mexico, and to require that the rules of law and stipulations of treaties should be observed by Mexico towards the United States and its citizens. His duty was, second, as the head of a foreign power, to respect the independence of Mexico, to refrain from all interference with her internal affairs, from all attempts at dominance except as he was justified by the law of nations for the protection of American rights."

Mr. Root declared that the President had failed to fulfill any of these duties; that he interfered in Mexico to aid one faction in civil strife against another; that he undertook to pull down Huerta and set up Carranza in his place; and that when Huerta had refused a demand which was in substance that he should retire permanently from the Government of Mexico, the power of the United States was applied to turn him out. Arms and munitions of war were freely furnished to forces opposed to him, and finally the President sent the army and navy to invade Mexico and capture its great sea port of Vera Cruz and hold it and throttle American commerce until Huerta fell. With the occupation of Vera Cruz the moral power of the United States over Mexico ended. We were then and we are now hated for what we did to Mexico, and we were then and we are now despised for our feeble and irresolute failure to protect the lives and rights of our citizens. No flag is so dishonored and no citizenship so little worth the claiming in Mexico as ours. That is why we have failed in Mexico."

Mr. Root's attitude toward the diplomatic relations of the United States with Europe during the war was even more severe. He said: "A study of the administration's policy toward Europe since July, 1914, reveals three fundamental errors: First, the lack of foresight to make any

provision for backing up American diplomacy by actual or assured military and naval force. Second, the forfeiture of the world's respect for our assertion of rights by pursuing the policy of making threats and failing to make them good. Third, the loss to the moral force of the civilized world through failure to truly interpret to the world the spirit of the American democracy in its attitude toward the terrible events which accompanied the early stages of the war." He contrasted the action of Switzerland and Holland into at once mobilizing their forces of trained soldiers and thus preserving their territory as independent and inviolate with the action of the United States. He said: "Ordinary practical sense in the conduct of affairs demanded that such steps should be taken that behind the peaceable assertion of our country's rights, its independence, and its honor should stand power and manifest purpose, warning the whole world that it would cost too much to press aggression too far." Mr. Root declared that while many persons saw the necessity of such action the Democratic government did not see it, and that the President described those who advocated prompt measures as being nervous and excited.

He then reviewed the course of diplomatic negotiations with Germany following the sinking of merchant ships on which were American citizens. After characterizing the action of the administration as "threatening in words but irresolute in action," he said: "Measured and restrained expression backed to the full by serious purpose have strength and respect. Extreme and belligerent expression, unsupported by resolution, is weak and without effect. No man should draw a pistol who does not dare to shoot. The government that shakes its fist first, and its finger afterward, falls into contempt. Our diplomacy has lost its authority and influence, because we have been brave in words and irresolute in action. Men may say that the words of our diplomatic notes were justified; men may say that our inaction was justified, but no man can say that both our words and our inaction were wise and creditable."

Mr. Root declared that the invasion of Belgium should have been met with strong protest on the part of the American government. He said: "The American people were entitled not only to feel but to speak concerning the wrong done to Belgium. It was not like interference in the internal affairs of Mexico, or any other nation, for this was an international wrong. The law protecting Belgium, which was violated, was our law, and the law of every other civilized country. For generations we have been urging on their help in its development and in its establishment. . . . We have bound ourselves by it; we have regulated our conduct by it; and we are entitled to have other nations observe it. . . . Yet the American government acquiesced in the treatment of Belgium and the destruction of the law of nations. Without one word of objection or dissent to the repudiation of law or the breach of our treaty or the violation of justice and humanity in the treatment of Belgium our government enjoined upon the people of the United States an indiscriminating and all-embracing neutrality, and the President admonished the people that they must be neutral in all respects, in act, word, thought, and sentiment. We were not to be neutral merely as to



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**VANCE C. McCORMICK**  
Chairman Democratic National Committee



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**WILLIAM R. WILLCOX**  
Chairman Republican National Committee



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**GEORGE W. PERKINS**



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**HIRAM W. JOHNSON**

FOUR IMPORTANT WORKERS IN THE PRESIDENTIAL CAMPAIGN OF 1916



the quarrels of Europe, but neutral as to the treatment of Belgium; neutral between right and wrong; neutral between justice and injustice; neutral between humanity and cruelty; neutral between liberty and oppression. A single expression by the Government of the United State," said Mr. Root, "a single sentence denying assent and recording disapproval of what Germany did in Belgium would have given to the people of America that leadership to which they are entitled, in their earnest grope for the light. It would have ranged behind American leadership the conscience and morality of the neutral world. It would have brought to American diplomacy the respect of loyalty to a good cause."

In conclusion Mr. Root said: "We have not been following the path of peace. We have been blindly stumbling along the road that, continued, will lead to inevitable war. Our diplomacy has dealt with symptoms and ignored causes. The great decisive question upon which our peace depends is the question whether the rule of action applied to Belgium is to be tolerated. If it is tolerated, by the civilized world, this nation will have to fight for its life. There will be no escape. That is the critical point of defense for the peace of America.

"When our government failed to tell the truth about Belgium, it lost the opportunity for leadership of the moral sense of the American people, and it lost the power which a knowledge of that leadership and a sympathetic response from the moral sense of the world would have given to our diplomacy. When our government failed to make any provision whatever for defending its rights in case they should be trampled upon, it lost the power which a belief in its readiness and will to maintain its rights would have given to its diplomatic representations. When our government gave notice to Germany that it would destroy American lives and American ships at its peril, our words, which would have been potent if sustained by adequate preparation to make them good, and by the prestige and authority of the moral leadership of a great people in a great cause, were treated with a contempt which should have been foreseen; and when our government failed to make those words good, its diplomacy was bankrupt."

Prior to the delivery of this speech Mr. Root had, on January 12th, requested that his name be kept off the Minnesota primary ballot for presidential preference election.

The attitude of Colonel Roosevelt toward the election, at the beginning of the year, was not altogether clear. It was known that under certain conditions he would accept the nomination. As the weeks went by his position in regard to the nomination was made clearer. On January 30th he delivered an address in Brooklyn. It was devoted chiefly to the attitude of the United States toward the European war. Concerning the attitude of the Wilson administration toward the Teutonic powers he said: "We are asked to kiss the bloody hands of the murderers of our women and children and to serve as the tool of these men against those nations which have behaved more valiantly and righteously than we have." He declared that in his opinion the United States was actually bound by the Hague convention to protect Belgian neutrality. He also made a strong plea for preparedness in universal military training. On February 17th he

sailed for the West Indies. He made several speeches during his visit, in some of which he again attacked the Wilson administration. At the same time he gave a statement of his position in regard to the nomination to Henry L. Stoddard of the *New York Mail*. An active effort had been made in Massachusetts to elect delegates at large to the Republican National Convention who should be pledged to his nomination, and in response to an inquiry from Mr. Stoddard in regard to his position he said:

"I will not enter any fight for the nomination, and I will not permit any factional fight to be made in my behalf. Indeed, I will go further and say, it would be a mistake to nominate me unless the country has in its mood something of the heroic, unless it feels not only like devoting itself to ideals, but to the purpose measurably to realize those ideals in action." He continued: "This is one of those rare times which come only in long intervals in a nation's history, when the action taken determines the life of the generations that follow. Such times were those from 1776 to 1789, in the days of Washington, and from 1858 to 1865, in the days of Lincoln. It is for us to grapple with the tremendous national and international problems of our own hour in the spirit and with the ability shown by those who upheld the hands of Washington and Lincoln." He declared that upon the next administration there rests a responsibility for the future of the country which cannot be overestimated. He continued:

"We must clarify and define our policies. We must show that our belief in our governmental ideals is so real that we wish to make them count in the world at large, and to make the necessary sacrifice in order that they shall count surely. We of this great republic have a contribution to make to the cause of humanity, and we cannot make it unless we first show that we can secure prosperity and fair dealing among our own men and women.

"I believe that in a crisis so grave it is impossible too greatly to magnify the needs of the country or too strongly to dwell on the necessity of minimizing and subordinating the desires of individuals. The delegates who go to Chicago will have it in their power to determine the character of the administration which is to do or leave undone the mighty tasks of the next four years. That administration can do an incalculable amount to make or mar our country's future."

Mr. Roosevelt returned to the United States in the latter part of March, and on March 29th gave out a statement replying to a charge made by President Wilson that wealthy American owners of property in Mexico had attempted by sinister methods to bring about the intervention of the United States in that republic. He reviewed the events on the border in the preceding three years, and charged that the loss of American lives in Mexico was due to the shipment of arms to "first one set of bandits and then to another." He charged incompetence and mismanagement on the part of the administration, and characterized the pursuit of Villa as "the second war in Mexico," the Vera Cruz incident being cited as the first. On March 31st Mr. Roosevelt met at the home of Mr. Robert Bacon, former Senator Root, Senator Lodge of Massachusetts, and Gen. Leonard Wood. This was the first meeting of Mr. Roosevelt and Mr.

Root since 1912, when they had parted as a result of the split in the Republican party. Mr. Root was the presiding official at the national convention in 1912, and his conduct in that capacity was bitterly resented by Mr. Roosevelt during the progress of the campaign. This reunion was an indication in the minds of many that an attempt was being made to reconcile Mr. Roosevelt with the leaders of the regular Republican party, although those present at the meeting denied that there had been any effort to bring this about.

On April 5th Mr. Roosevelt made clear to a group of political visitors at Oyster Bay on what conditions he would accept the nomination for presidency. To one of the visitors who suggested that he might be the nominee of the convention Mr. Roosevelt said: "Let me give you a piece of advice. If you have any doubt on the subject do not nominate me. Get it perfectly clear in your head that if you nominate me it mustn't be because you think it is in my interest, but because you think it is in your interest and the interest of the Republican party, and because you think it to the interest of the United States to do so." Roosevelt then continued to outline his belief as to the important issues before the people at the present time.

"Don't be for me unless you are prepared to say that every citizen of this country has got to be pro-United States, first, last and all the time, and not pro anything else at all, and that we stand for every good American everywhere, whatever his birthplace or creed, and wherever he now lives, and that in return we demand that he be an American and nothing else, with no hyphen about him.

"Every American citizen must be for America first and for no other country even second, and he hasn't any right to be in the United States at all if he has any divided loyalty between this country and any other.

"I don't care a rap for the man's creed or birthplace or national origin, so long as he is straight United States. I am for him if he is straight United States, and if he isn't I am against him."

The second item sets forth his views on war:

"I am not for war; on the contrary, I abhor an unjust or a wanton war, and I would use every honorable expedient to avoid even a just war. But I feel with all my heart that you don't, in the long run, avoid war by making other people believe that you are afraid to fight for your own rights.

"Uncle Sam must never wrong the weak; he must never insult any one or wantonly give cause of offense to either the weak or the strong."

The last item deals, of course, with preparedness:

"And don't you nominate me unless you are prepared to take the position that Uncle Sam is to be strong enough to defend his rights and to defend every one of his people wherever those people are, and he can't be strong enough unless he prepares in advance. . . . The squarest possible way to enable him to keep the peace and to keep it on terms that will enable Americans to hold their heads high and not hang them in shame is for him to be so prepared in advance—and I mean prepared in his own soul as well as with his army and navy—that when he says anything the rest of the world will know that he means it, and that he can make it good.

"Don't you try to nominate me unless you think that is the policy that ought to be followed out, and followed out for your sake as much as for mine, and for the sake of the rest of us here in the United States, and don't forget that isn't a course that provokes war; it is the only course that, in the long run, prevents war, and secures national self-respect and guarantees the honor of this country, and the rights of its citizens wherever they may be."

On April 7th 75 prominent Republicans of New York State, including many delegates elected to the national convention, issued a public endorsement of Elihu Root for President. He was set forth in this endorsement as "the ablest liv-

ing American." The platform on which his nomination was proposed was one of Americanism and preparedness. The 75 names included those of Nicholas Murray Butler, Cornelius N. Bliss, Otto Bannard, Joseph H. Choate, Chauncey M. Depew, John G. Milburn, Job E. Hedges, William A. Prendergast, Henry L. Stimson, and Senator James W. Wadsworth, Jr. There were included many well-known lawyers and as a whole those signing the endorsement were identified more or less with the conservative element of the party. The main plank of the platform proposed for the nomination of Mr. Root differed but little in its essentials from that emphasized as being necessary by Mr. Roosevelt.

On April 29th Colonel Roosevelt addressed the members of the Illinois Bar Association in Chicago, speaking on current national and international problems. The address was devoted in the main to the subject of preparedness.

On May 19th he delivered a notable address in Detroit on the same general subjects. This was of more than unusual interest because it was made in the city which is the home of Henry Ford, the most conspicuous advocate of peace. Mr. Roosevelt made no attack upon Mr. Ford, but his address was a long, elaborate, and temperate statement of his beliefs. He declared that the object of preparedness is not war but the prevention of war. As to pacific measures to be adopted he said:

"I believe in a thoroughly efficient navy, the second in size in the world. I believe in a small but thoroughly efficient regular army, an army of 250,000 men, with a proper reserve. This would give us a mobile army of 125,000 men. But back of the regular army and navy must stand the strength of the people themselves, and this strength must be prepared in advance or it will be utterly useless in time of trial."

He did not limit his argument for preparedness to merely military manifestation, but declared:

"There must be a deliberate purpose to see that the health and well-being of the workers, their standard of wages and of living and of the education of their children are held up to the level that will insure the greatest national efficiency, not only for the present, but for the future.

"We must abolish pork-barrel methods in the army—as regards army posts, navy yards, as regards everything else.

"Pork-barrel graft is a crime against the nation when the army and navy are involved. But honesty and efficiency in managing the army and navy only represent the beginning of military preparedness.

"We can have no effective army unless business is mobilized and especially unless our transportation system is nationalized. The railroads, whose business is directly or indirectly interstate, must, in all their relations, be regulated by the national government and not by forty-eight conflicting State governments.

"The merchant marine must be developed not only for our own purpose of peace, but as a basis for the navy. It must be proportionate to the transportation needs and to the navy of this country. Our merchant fleet must build up a naval reserve. We must safeguard the rights of our sailors, but we can only do so if we upbuild the lines of ships on which they are to serve."

Following this address he made a tour in the Middle West, and was heard with great enthusiasm in Kansas City and St. Louis. He finished with a speech at Newark, N. J., on June 1st.

Thus far it will be noted that Mr. Roosevelt was the most conspicuous figure in the pre-convention campaign. The manifesto in behalf of Mr. Root, noted above, did not meet with enthusiasm, and little effort was made thereafter to press his nomination. The sentiment for Mr. Hughes did not approach anywhere to a point of enthusiasm, but he was everywhere spoken

of as a strong possibility. The Republican State Convention adopted a resolution calling for the nomination of "a tried Republican on whose record and character the nation can rely as a guarantee of wise statesmanship in the management of foreign and domestic affairs." Senator Mills, who proposed this resolution, declared that it was intended to favor Mr. Hughes, but Senator Wadsworth, who voted for it, asserted that in accordance with his understanding it was meant to apply to Mr. Root. Mr. Hughes continued to preserve absolute silence in regard to his nomination. He had, however, permitted his name to appear on the ballot in several of the presidential primaries, and the fact that he would serve if nominated was generally accepted. On June 5th he made the only address which put any interpretation on his attitude on questions at issue. Speaking on that date before the graduates of the National Cathedral School at Washington, he urged a strong and efficient nation of undivided allegiance equal to its task.

No other candidate had developed the strength which would indicate their possible nomination in preference to the three already discussed. A number of "favorite sons" of the different States were voted for in the presidential preference primary elections, as will be noted below, but it will be observed that these were indications of local pride, and that they would have little or no strength in the convention.

**DEMOCRATIC PRE-CONVENTION CAMPAIGN.** The pre-convention campaign of the Democrats differed from that of the Republican party in that there was at no time any doubt as to who would be the nominee for the Presidency. Although at the beginning of the year President Wilson had not definitely announced himself as a candidate, he had not indicated in any way that he was unwilling to accept another nomination. On January 6th he permitted his name to be placed on the ballot in the primary election to be held in Indiana in March. This was assumed to be an authoritative indication that he was an active candidate, and there was no discussion of any other nominee on the part of the leaders of the party. It may be said in general that President Wilson made little effort in the months prior to the convention along the lines directly connected with the campaign. He made a number of speeches on national issues, which were of course connected directly with his candidacy in that they outlined his policies and formed a defense of his administration. These addresses, however, come more properly in the history of the administration in 1916 than in the history of the presidential campaign, and they are further treated in the section *Administration* under the article UNITED STATES. It is necessary here to indicate as a record just where these addresses were made, and on what dates.

President Wilson began a series of speeches on preparedness on January 27th at a dinner given by the Railway Business Association in New York, and on the following day he began a speaking tour in the Middle West. On January 29th he spoke at Cleveland, on the 31st in Chicago, and on the days following in other cities of the Middle West, including Topeka, Des Moines, St. Louis, Milwaukee, and Kansas City. On his return from this tour he made an address before the members of the Gridiron Club on February 27th. In his address he declared that

violation of the essential traditions of America would be the only justification for the United States entering the European war. He said: "America ought to keep out of this war. She ought to keep out of this war at the sacrifice of everything except this single thing upon which her character and justice are founded—her sense of humanity and justice." In an address delivered before the National Press Club at Washington, on May 15th, he declared that if the United States did not keep out of the European war there would be nobody to find the solution to the great problem confronting the world when the war was over. On May 27th he made a notable address before the League to Enforce Peace. In this he outlined in general terms the basis on which the United States would undertake, suggest, or initiate the movement for peace in Europe. On May 30th he delivered the Memorial Day address at the Arlington National Cemetery. The keynote of this speech was "America first." Part of this address was given over to a criticism of hyphenated Americans, whom he said he did not blame for a pride of race and love of the places of their birth, but who should not allow this love of another nationality to overthrow their ardor for America. Replying to a criticism that his suggestion for a combination of nations to prevent war meant an entangling alliance for the United States, he declared that he favored an alliance to disentangle the peoples of the world from combinations for their own separate and private interests.

In the presidential preference elections held during the months preceding the convention Mr. Wilson was in all cases the choice of the Democratic voters, and there was no question as to his nomination.

**PROGRESSIVE PRE-CONVENTION CAMPAIGN.** The pre-convention campaign of the Progressive party was so involved with the relations of Mr. Roosevelt to the Republican party as a possible candidate that it is difficult to treat it separately. On January 11th the Progressive national committee met at Chicago and called a national convention to meet in that city at the time of the assembling of the Republican convention and in order to have if possible "both the Progressive and Republican parties choose the same standard bearers, and the same principles." The committee declared its continued allegiance to the following principles:

A broader nationalism; regulation rather than disruption of efficient business concerns, behavior and not size being the test; a permanent non-partisan scientific tariff commission; revision of the tariff to fit war conditions, and for the protection of new industries introduced as a result of the war; equal suffrage; dethronement of the invisible government; an adequate merchant marine.

In addition to these declarations, which in effect were the same as were contained in previous platforms of the party, two new ones were added:

"Complete preparedness not only military but economic; a preparedness that will unify American citizenship and create a renewed loyalty.

"The faith of our forefathers which made the American flag a sufficient protection of American citizens around the world."

The committee closed its declaration with the following statement:

"In this turning point in world history we

will not stick to details; we will lay aside partisanship and prejudice. But we will never surrender those principles for which we stand and have stood. We will follow only a leader who we know stands for them, and is able to put them through."

For the most part there was no attempt to continue the Progressive organization as a party in the different States, and in only a few of the presidential primaries were Progressive tickets presented in nomination.

**PRESIDENTIAL PRIMARY ELECTIONS.** Presidential primary elections were comparatively common in the States in 1916. The movement had first started in 1912, and had been especially urged by the Progressive party as a proper method of indicating preference of voters in the States for a presidential candidate. During the years intervening many of the States had passed measures providing for such elections. It cannot be said that the results of the movement in 1916 indicated that such elections were of special importance. For the most part the candidates voted for were those identified with the States in which the elections were held, and the votes were more or less complimentary. Indiana was the first of the States to hold such an election on March 7th. Charles W. Fairbanks, former Senator from the State, and former Vice-President of the United States, was endorsed by the Republicans without opposition. President Wilson received the Democratic endorsement. On the same day the voters of Vermont ratified a presidential primary measure. In the Minnesota primaries held on March 14th Senator Cummins of Iowa was endorsed by the Republicans for the nomination, the other candidate being Senator La Follette. The voters of North Dakota on March 21st declared their preference for Senator La Follette of Wisconsin for President, defeating Henry D. Estabrook, of New York. In the presidential primaries held in Michigan on April 3rd, Henry Ford of Detroit won the Republican endorsement over Senator William A. Smith. President Wilson was the unopposed Democratic candidate. In the primaries held in Wisconsin on April 4th Senator La Follette received a bare majority of Republican votes. In Iowa on April 10th Senator Cummins received the endorsement of the Iowa Republicans. Senator Sherman was the choice of the voters of Illinois in the preference election held on April 11th. In this election 12,000 Republican voters wrote Theodore Roosevelt's name on the ballots. There was no Democratic candidate in opposition to President Wilson. The Republicans of Nebraska on April 18th declared their preference for Senator Cummins of Iowa, for presidential nominee as against Henry Ford. In the Montana presidential preference primaries held on April 21st the names of Woodrow Wilson and Senator Cummins were the only ones printed on the ballot. In Massachusetts on April 25th the Republicans elected unpledged delegates to the national convention. Four candidates for delegates at large avowedly for Colonel Roosevelt, but running without his approval, received 45,000 votes. In Ohio on the same day the Republicans endorsed Theodore E. Burton for President, and in New Jersey the Republicans owing to technicalities were unable to express their choice, but the Democrats endorsed Woodrow Wilson. In Maryland on May 1st the Republicans elected uninstructed delegates to the na-

tional convention. On May 2nd, in California, the election resulted in a defeat for electors supported by Governor Johnson and the Progressive element. The Pennsylvania Republicans on May 16th expressed their preference for Governor Brumbaugh. In Vermont on the same day Justice Hughes led other Republican candidates, while President Wilson was the unopposed choice of the Democrats.

In all, 19 Northern and Western States elected delegates by direct primary. Wide divergence existed as to methods of electing these delegates, varying from State-wide vote for entire State delegates, as in California, to the election of delegates by counties to a State convention, as in Maryland. In some States there was a direct preferential vote provided for nominees for the presidency, but in most States there was a binding provision compelling the elected delegates to support the preferential candidate in the national convention. As a matter of record it may be noted that primaries were held in different States on the following dates:

California, May 2.	New Jersey, April 25.
Illinois, April 11.	North Dakota, March 21.
Indiana, March 7.	Ohio, April 25.
Maryland, May 1.	Oregon, May 10.
Massachusetts, April 25.	Pennsylvania, May 16.
Michigan, April 8.	South Dakota, May 23.
Minnesota, March 14.	Vermont, March 7.
Nebraska, April 18.	West Virginia, June 6.
New Hampshire, March 14.	Wisconsin, April 4.
Iowa, April 10.	

## II. THE CONVENTIONS

**REPUBLICAN CONVENTION.** At a meeting of the Republican national committee held on Dec. 14, 1915, it was decided that the national convention should meet in Chicago on June 7th. At the same meeting of the committee it was decided to reduce the Southern representation in the national convention to about 30 per cent, less than it had hitherto been. This was done by the application of an apportionment system uniformly throughout the entire country. In accordance with this system the apportionment of delegates from the Southern States was 174 in 1916, instead of 252 as in 1912. New York was the only Northern State which also suffered a loss in representation. There were three less delegates from that State in 1916 than in 1912. The total number of delegates entitled to a vote in convention after this reduction had been made was 984. Although the formal meeting of the convention did not begin until June 7th, by June 1st the preliminary proceedings were well under way. The national committee met to pass on the contested seats and make the arrangements for the convention, but there developed in this first meeting a strong undercurrent of opinion in favor of Mr. Hughes. Senator Reed Smoot of Utah, identified with the conservative wing of the Republican party, was one of the first to declare himself for Mr. Hughes. Colonel Roosevelt, however, had many strong supporters among the Republican leaders.

There was a notable absence of contests for seats in the convention, and in this conditions differed widely from those in 1912, when the bitter fights for seating of rival delegates well-nigh disrupted the convention. Nearly all the contested seats were in the Southern States, and all were settled amicably. The drift toward Hughes noted above aroused alarm among the Republican supporters of Colonel Roosevelt, and



on June 5th George M. Cortelyou arrived in Chicago as a representative of Mr. Roosevelt. Mr. Cortelyou was private secretary to President Roosevelt, and was later Secretary of the Treasury. A strong pro-German opposition to the nomination of Colonel Roosevelt developed during the days prior to the convention. The leaders of this movement were also bitterly opposed to the nomination of Mr. Root. The disposition of these pro-German leaders was for the nomination of Mr. Hughes, although there had been no indication from him that they would receive any support in the event that he was elected. The general attitude of the pro-Germans was that they would support any man proposed by the convention with the exception of Root and Roosevelt.

On June 5th the Hughes sentiment took substance at a meeting of 150 delegates at the Sherman House. These delegates came from a dozen different States, and assembled voluntarily to form an organization. Until this meeting there had been no concrete expression of Mr. Hughes's strength. It had been recognized, but had been difficult to identify. The movement was organized by Charles W. Fulton, former United States Senator from Oregon, and was strongly supported by Governor Whitman of New York, F. H. Hitchcock, and others.

The supporters of "favorite sons" maintained headquarters, but the movement for the support of these never attained serious dimensions. The only important element which these candidacies gave was in the control of the voting. It was claimed that they would have the balance of power in the convention, and would nominate whomever received their vote. The claim was made that the delegates pledged to these candidates controlled at least 600 votes. The canvass made upon the day prior to the meeting of the convention indicated that Mr. Hughes would have the strength of at least 300 votes before a ballot was taken.

The 16th national convention of the Republican party assembled at 11 o'clock on June 8th. Over 12,000 were in the Coliseum, but there was remarkable absence of enthusiasm in the opening hours. A prayer was offered by the Rev. John Timothy Stone, which was followed by a reading of the call for the national convention. There was then an announcement of the temporary officers, who were Senator Warren Harding of Ohio, chairman; William J. Stone, sergeant-at-arms; and James B. Reynolds, secretary. The address of the temporary chairman, Senator Harding, was received with very little applause, and with little enthusiasm. The most notable incident of the first day was the dispatching of a telegram to Colonel Roosevelt by William P. Jackson, the Republican national committeeman from Maryland. This telegram read as follows:

"The national interests demand the complete reunion of the Republican party, which unhappily divided in 1912. I believe that this can be accomplished by a more perfect understanding between you and the Republican party now available. I therefore earnestly urge you to come to Chicago immediately to address this convention, and take common cause with their deliberations. If you will indicate your willingness and adopt this course I will use my utmost endeavors to secure for you the privileges of the convention floor."

This telegram was sent on Mr. Jackson's own

responsibility, although it was believed to have the endorsement of some of the Republican leaders. It was an attempt to bring about a reconciliation between the Progressive and Republican leaders, in order to unite them upon the one candidate. The Progressive convention, as will be noted below, was in session at the same time as the Republican, and efforts made to unite upon one candidate had thus far failed. It was believed by certain leaders of both parties that Mr. Roosevelt was the only person who could bring such an agreement about. While the convention was in session the committee on resolutions headed by Henry C. Lodge was planning the platform. An attempt was made to defeat Mr. Lodge for the position as chairman by those identified with the pro-German movement, but this had failed. Those who drafted the platform were Senator Lodge of Massachusetts, Senator Borah of Idaho, Senator Fall of New Mexico, Senator Oliver of Pennsylvania, Senator Wadsworth of New York, Representative Madden of Illinois, Theodore E. Burton of Ohio, and Charles Hopkins Clark, of Connecticut.

The only propositions which excited controversy in the deliberations of the committee were those relating to Mexico, preparedness, "Americanism," and the references made to the Wilson administration.

The first day of the convention was marked by a procession of suffragettes, who in the midst of a driving rain and windstorm marched down Michigan Avenue.

In a further effort to bring about an agreement between the Republican and Progressive conventions a conference was arranged for by the leaders of the two parties, and on June 8th the following committee was appointed to confer: Republicans, Reed Smoot, W. Murray Crane, William E. Crane, Nicholas Murray Butler, A. R. Johnson; Progressives, George W. Perkins, Hiram Johnson, Horace Wilkinson, Charles J. Bonaparte, and John M. Parker. Two short sessions of the convention were held on June 8th, and no important business was transacted pending the deliberation of the conference. Senator Harding was made permanent chairman, rules for the convention were adopted, and speeches were delivered by Chauncey M. Depew of New York, Joseph G. Cannon of Illinois, and Senator Borah of Idaho. At the afternoon session held on this day the party platform was adopted, and this will be found in full at the conclusion of this section. The conference committee deliberated all day on June 8th, and adjourned at 12.30 o'clock on the morning of June 9th, without having come to any conclusion.

In the meantime Colonel Roosevelt had replied with a long telegram to the message of Mr. Jackson given above. He declared his readiness to address the Republican convention, but declared that that decision remained entirely with the convention. He begged both Republicans and Progressives to keep constantly in mind the gravity of the crisis not only for America, but for the world, and the need that their action in dignity, foresight, and patriotism should rise level to the crisis. He said: "I hope that their aim will not be merely to nominate a man who can be elected next November, but a man of such power, character, steadfast conviction, and proved ability that if elected he will

again place this nation where it belongs by making it true to itself and, therefore, true to all mankind." He declared that the issues which had hitherto divided the Progressives and Republicans sank into nothing compared with those then demanding decision. He assailed the activities of the "professional" German-Americans in attempting to control the nomination of the convention, and the platform utterances. No formal invitation was sent to Colonel Roosevelt to address the Republican convention. The conference committee continued their deliberations throughout June 9th without arriving at any conclusion. The Progressive conferees urged that Colonel Roosevelt was the only solution, but asked the Republicans for a counter-proposal. The latter replied that they had none, and would have none before this convention nominated a candidate. An adjournment was made at 2 A. M. on June 10th without any definite agreement having been arrived at.

The first ballots for nomination were taken on June 9th. Prior to the taking of the ballot the conference committee made the following report:

"Your committee appointed pursuant to the resolution adopted at yesterday's sessions met in conference with the committee representing the National Progressive Convention last evening. The conference was free, frank, and most friendly. The conferees were of one mind in believing that the good of the country and perhaps its repute and influence for years to come depends upon the complete defeat of the present Democratic administration, and restoration of the control of the executive and legislative branches of the government to the hands of those who firmly believe in and will execute the policies that are so heartily supported by the Republican and Progressive parties alike.

"The Progressive conferees were unanimous in urging with temperateness and fairness, the opinion that Theodore Roosevelt, of New York, had so large a personal relation to the issues of the coming campaign as to make him the most desirable candidate upon which to unite.

"It was agreed that your conferees would report these facts to this convention."

Following this report the convention proceeded to the nomination of candidates. On the roll call Arizona yielded to New York. That resulted in the unusual spectacle of one State using the time of another State to nominate two candidates, Mr. Hughes and Mr. Root. Governor Whitman placed Mr. Hughes in nomination. The name of Mr. Hughes as Governor Whitman closed his address was the signal for the start of a remarkable demonstration, in which a majority of the delegates joined, although about half of the New York delegates remained seated, and all those of Indiana, Pennsylvania, New Jersey, Illinois, and some of the smaller States. The other delegates marched uproariously around the convention hall, shouting for the nomination of Hughes. The demonstration lasted over seven minutes.

Following this Nicholas Murray Butler presented the name of Senator Root. This was also followed by a demonstration. Governor Frank D. Willis of Ohio then nominated former Senator Theodore E. Burton, and Senator Lodge of Massachusetts nominated Senator John W. Weeks. Senator Lawrence Y. Sherman of Illinois was nominated by William J. Calhoun of

Illinois, and William R. Wood of Indiana nominated Charles W. Fairbanks. The name of Senator Cummins of Iowa was placed in nomination by Nathan E. Kendall of Iowa. Following all these, Senator Fall of New Mexico nominated Theodore Roosevelt. The nomination was well received, but there was no remarkable outburst of enthusiasm. Senator La Follette of Wisconsin was nominated by M. B. Olbrich of Wisconsin. Following a number of seconding speeches the first ballot was taken. This resulted as follows: Hughes 253½, Weeks 105, Root 103, Cummins 85, Burton 77½, Fairbanks 74½, Sherman 66, Roosevelt 65, Knox 36, Ford 32, Brumbaugh 20, La Follette 25, Taft 14, Du Pont 12, Willis 4, Borah 2, McCall 1. Not voting, 2½. In the second ballot the leading candidates had the following votes. Hughes 325½, Root 98½, Fairbanks 88½, Cummins 85, Roosevelt 81, Weeks 79.

Following the second ballot Senator Penrose moved to adjourn until the following day. This was in accordance with the understanding that had prevailed during the day among the leaders that there should be an adjournment to give the conference committee, after enough ballots had been taken, an idea of the preference of the Republicans. Adjournment was violently opposed by the Hughes delegates, but they were unable to prevent it. Following this the conference committee again went into session.

At the assembling of the convention on the third day there was little doubt as to the nomination of Mr. Hughes. At the opening of the session Senator Smoot reported that the Republican conferees had sent to the Progressive convention the following communication:

"On behalf of the Republican conferees we place for consideration as a candidate, Justice Hughes. It is plain that he will soon command the majority of the support of the Republican convention. His availability as a candidate rests, first, upon his known character and ability, second, upon his public service as Governor of New York, third, upon his removal from any association with the convention of 1912, and the differences which then arose.

"The support of Justice Hughes in the Republican convention reflects spontaneous interest and pleasure in his candidacy, which have shown themselves in widely different States among all classes and groups of voters. These have shown themselves without any organization in his behalf, with the common belief that the candidacy would be acceptable to all groups of Republicans, and would reunite them.

"His preliminary silence as to recent issues is the necessary result of his judicial position. His early speeches and declarations, however, give ground for the assurance that he is in accord with the platform that has been adopted by the Republican and Progressive conventions."

To this communication the Progressive conferees sent a reply promising to present the communication to the national convention. Senator Smoot also reported to the convention that the Progressives had received a telegram from Colonel Roosevelt proposing the name of Henry C. Lodge as a candidate upon whom the two parties might unite.

Upon receiving these reports the convention proceeded to the third ballot. Senator Weeks ascended the platform and withdrew his name, giving his supporters the right to vote for whom

they wished. The name of Senator Sherman was also withdrawn, and after the ballot had begun the name of Colonel Roosevelt was withdrawn. This was followed by the withdrawal of nearly all the other minor candidates. Voting on the third ballot was unanimous for Hughes until Massachusetts was reached. The vote of that State was divided by giving 32 to Hughes, 3 to Roosevelt, and 1 to Weeks. The roll call was completed at 12.30, with the following result: Hughes 949½, Roosevelt 18½, Weeks 3, Lodge 7, Du Pont 5, and La Follette 3. The total vote was 987. Necessary for choice 494. The applause following the announcement of the vote lasted about 15 minutes. It was then moved by Alexander P. Moore of Pittsburgh, a prominent supporter of Colonel Roosevelt, that the nomination be made unanimous. This was seconded by Senator Lodge, who said: "This convention has chosen as its candidate a strong, able, distinguished, upright man, and a thorough American. He should have the cordial support not only of every Republican from one end of the country to the other, but of every man who honestly believes that another four years of the present administration would be a calamity to the United States." The ballot for vice-president then began and Charles W. Fairbanks was nominated by John Wanamaker. The only other nomination was that of Elmer J. Burkett of Nebraska. The vote for vice-president was 869 for Fairbanks, Burkett 108, Borah 7, Hiram W. Johnson of California 2, Webster 2, Burton 1, not voting 4. The nomination of Mr. Fairbanks was then made unanimous. Chairman Harding announced that he had sent a telegram to Justice Hughes informing him of his nomination. The convention adjourned at 2 o'clock. The detailed vote on the last ballot for President is given in the following table:

THE THIRD REPUBLICAN BALLOT WHICH NOMINATED JUSTICE HUGHES

STATES	Hughes	Roosevelt	Weeks	Lodge	Du Pont	La Follette
Alabama	16					
Alaska	2					
Arizona	6					
Arkansas	15					
California	26					
Colorado	12					
Connecticut	14					
Delaware	6					
Florida	8					
Georgia	17					
Hawaii	2					
Idaho	8					
Illinois	58					
Indiana	30					
Iowa	26					
Kansas	20					
Kentucky	26					
Louisiana	12					
Maine	12					
Maryland	15	1				
Massachusetts	32	3	1			
Michigan	30					
Minnesota	24					
Mississippi	8½	3½				
Missouri	34		2			
Montana	7	1				
Nebraska	16					
Nevada	6					
New Hampshire	8					
New Jersey	27	1				
New Mexico	5	1				
New York	87					
North Carolina	14			7		

STATES	Hughes	Roosevelt	Weeks	Lodge	Du Pont	La Follette
North Dakota	10					
Ohio	48					
Oklahoma	19	1				
Oregon	10					
Pennsylvania	72	3				
Philippines	2					
Rhode Island	10					
South Carolina	6					
South Dakota	10					
Tennessee	18	3				
Texas	26					
Utah	7	1				
Vermont	8					
Virginia	15					
Washington	14					
West Virginia	16					
Wisconsin	23					8
Wyoming	6					
Totals	949½	18½	3	7	5	3

Absent—1 from Pennsylvania.  
Total vote—987.  
Necessary for a choice—494.

Following the message of Senator Harding, announcing his nomination, Mr. Hughes sent the following message of acceptance:

"I have not desired the nomination. I have wished to remain on the bench. But in this critical period in our national history, I recognize that it is your right to summon and that it is my paramount duty to respond. You speak at a time of national exigency, transcending merely partisan considerations. You voice the demand for a dominant, thoroughgoing Americanism with firm protective upbuilding policies, essential to our peace and security; and to that call, in this crisis, I cannot fail to answer with the pledge of all that is in me to the service of our country. Therefore I accept the nomination.

"I stand for the firm and unflinching maintenance of all the rights of American citizens on land and sea. I neither impugn motives nor underestimate difficulties. But it is most regrettably true that in our foreign relations we have suffered incalculably from the weak and vacillating course which has been taken with regard to Mexico—a course lamentably wrong with regard to both our rights and our duties. We interfered without consistency, and while seeking to dictate when we were not concerned, we utterly failed to appreciate and discharge our plain duty to our own citizens.

"At the outset of the administration the high responsibilities of our diplomatic intercourse with foreign nations were subordinated to a conception of partisan requirements, and we presented to the world a humiliating spectacle of ineptitude. Belated efforts have not availed to recover the influence and prestige so unfortunately sacrificed; and brave words have been stripped of their force by indecision.

"I desire to see our diplomacy restored to its best standards and to have these advanced; to have no sacrifices of national interest to partisan expediences; to have the first ability of the country always at its command here and abroad in diplomatic intercourse; to maintain firmly our rights under international law; insisting steadfastly upon all our rights as neutrals, and fully performing our international obligations; and by the clear correctness and justness of our position and our manifest ability and disposition to sustain them to dignify our place among the nations.

"I stand for an Americanism that knows no ulterior purpose; for a patriotism that is single and complete. Whether native or naturalized, of whatever race or creed, we have but one country, and we do not for an instant tolerate any division of allegiance.

"I believe in making prompt provision to assure absolutely our national security. I believe in preparedness, not only entirely adequate for our defense with respect to numbers and equipment in both army and navy, but with all thoroughness to the end that in each branch of the service there may be the utmost efficiency under the most competent administrative heads. We are devoted to the ideals of honorable peace. We wish to promote all wise and practicable measures for the just settlement of international disputes.

"In view of our abiding ideals, there is no danger of militarism in this country. We have no policy of aggression, no lust for territory, no zeal for strife. It is in this

spirit that we demand adequate provision for national defense and we condemn the inexcusable neglect that has been shown in this matter of first national importance. We must have the strength which self-respect demands, the strength of an efficient nation ready for every emergency.

"Our preparation must be industrial and economic as well as military. Our severest tests will come after the war is over. We must make a fair and wise readjustment of the tariff, in accordance with sound protective principle, to insure our economic independence and to maintain American standards of living. We must conserve the just interests of labor, realizing that in democracy, patriotism, and national strength must be rooted an even-handed justice. In preventing as we must, unjust discrimination and monopolistic practices, we must still be zealous to assure the foundations of honest business. Particularly should we seek the expansion of foreign trade. We must not throttle American enterprise here or abroad, but rather promote it and take pride in honorable achievements.

"We must take up the serious problems of transportation, of interstate and foreign commerce, in a sensible and candid manner, and provide an enduring basis for prosperity by the intelligent use of the constitutional powers of Congress, so as adequately to protect the public on the one hand, and, on the other, to conserve the essential instrumentalities of progress.

"I stand for the principles of our civil service laws. In every department of government the highest efficiency must be insisted upon. For all laws and programmes are vain without efficient and impartial administration.

"I cannot within the limits of this statement speak upon all the subjects that will require attention. I can only say that I fully indorse the platform you have adopted.

"I deeply appreciate the responsibility you impose. I should have been glad to have that responsibility placed upon another. But I shall undertake to meet it, grateful for the confidence you express. I sincerely trust that all former differences may be forgotten and that we may have united effort in a patriotic realization of our national need and opportunity.

"I have resigned my judicial office and I am ready to devote myself unreservedly to the campaign.

"CHARLES E. HUGHES."

**PROGRESSIVE NATIONAL CONVENTION.** On January 11th, the Progressive national committee at a meeting in Chicago called a national convention to meet in that city at the same time that the Republican convention was to convene, and in order to have if possible "both the Progressive and Republican parties choose the same standard bearer and the same principles." This statement of the purposes of the convention may be taken as literally true, with this proviso that the "same standard bearer" should be Theodore Roosevelt. There was at no time during the convention the serious consideration of any other candidate for the presidency. The only division in opinion was among those who wished to nominate Mr. Roosevelt, whatever the action of the Republican convention might be, and those who bent their efforts to bring about an agreement between the two conventions to nominate Mr. Roosevelt. The struggle between these two opposing parties went on during the entire convention, and it was not until the action of Mr. Roosevelt himself put an end to the possibility of his nomination that the struggle ceased.

The "Roosevelt or no one" section was led by Victor Murdock of Kansas, Raymond Robbins of Chicago, John M. Parker of Louisiana, and others, and the more conservative wing by George W. Perkins of New York, James R. Garfield of Ohio, and Gifford Pinchot.

The convention was called to order at noon on June 7th by Victor Murdock, chairman of the Progressive national committee. A prayer was offered by Bishop William F. MacDowell, and this was followed by the reading of the call for the convention. Announcement was made that temporary officers would be Raymond Robbins, chairman; Frank P. Corrick, sergeant-at-

arms; and O. K. Davis, secretary. Mr. Robbins then delivered his speech as temporary chairman. The keynote of the address was: Preparedness, the issue, and Roosevelt, the man. He declared that the Progressives would stand by the announcement made by the national committee last January that the party would join the Republicans if they nominated a man true to the Progressive principles; that the principle, however, was greater than the party; if need be the Progressives would go on alone. He asserted that preparedness was the paramount issue of the campaign, and that Theodore Roosevelt was the man of the hour. He said: "Times of stress and ferment bring tribulation to the weak, and opportunity to the strong. The souls of the timid are vexed and the hearts of the valiant are uplifted. Four years ago brave deeds were done in Chicago. From every section of the country there gathered here men of leadership and character, disregarding the ties and associations of a lifetime, even of generations, willing to sacrifice power, influence and friendships, profits of lives of industry and honor in order that they might unite with their fellows in a spirit to bring a new force, a new impulse and a new hope into American politics. They enlisted for public service behind the bravest and wisest leader in our time, behind the foremost private citizen of the world—Theodore Roosevelt."

At the mention of Mr. Roosevelt's name the convention burst into a roar of applause, which lasted for 93 minutes, and was the longest sustained applause ever recorded in a national convention. When order had been restored Mr. Robbins outlined the domestic policies of the party, declared for universal suffrage and universal service. He attacked the leaders of the pro-German propaganda, and assailed the conduct of President Wilson's administration in its policy toward Mexico.

During the first session the delegates showed an enthusiasm which was in marked contrast with the demeanor of the Republican delegates who were at the same time holding their first meeting in the Coliseum. Delegates sang and shouted and showed the utmost exuberance. The convention adjourned its first session at 3.55 P. M. on June 7th, to await the report of the committee on resolutions, which was engaged in drafting the platform.

The second session of the convention met at 2.45 on June 8th. The chairman of the credentials committee reported that there were no contested delegates. From the permanent organization committee it was reported that the temporary officers would be made permanent. James R. Garfield of Ohio then arose to propose a resolution inviting the Republicans to a conference. He declared that the delegates were uncertain as to what action to take, but would certainly lose nothing by retaining the spirit of the declaration of the national committee made in January, that the party would do anything in reason to effect a reunion with the Republicans, but would not surrender its principles. He asked the delegates to be guided by reason rather than by enthusiasm, "and to bring to this country what it needs in this hour of great trial." He then read the following resolution:

"In the spirit of the statement approved at the meeting of the national committee held on January 11th last, the national convention of

the Progressive party invites and requests the national convention of the Republican party to appoint a committee of conference to meet and confer with a similar committee from this body." There were strong protests against this action on the part of certain of the radical delegates. Victor Murdock ascended the platform and made a speech which came almost to the point of bringing about Mr. Roosevelt's nomination. Mr. Robbins shouted to the delegates: "Is this convention supreme, and if so, are we going to surrender to a little coterie?" He asked again, "Do you want Theodore Roosevelt?" The delegates replied with loud cries of "Yes." "Then," shouted Mr. Murdock, "the one thing you ought to send the Republican convention is the nomination." An immense volume of applause responded to this, and it was impossible to secure order for many minutes. When the delegates had finally ceased shouting and taken their seats, the secretary read to the convention the telegram which Colonel Roosevelt had sent to Mr. Jackson, the Republican national committeeman, in response to an invitation to come to Chicago to address the Republican convention. The substance of this telegram has already been given in the section dealing with the Republican convention. Prof. Albert B. Hart followed the reading of the telegram by declaring that while the Progressives ought to wait a reasonable time before nominating Roosevelt, asked "What is a reasonable time?" He added that negotiations were begun months ago, and insisted that the dickering should not be prolonged. He asserted that Roosevelt had already been practically nominated by the convention, and that the actual nomination ought to take place before a ballot was taken in the Republican convention. Charles J. Bonaparte pleaded for a conference with the Republicans. After other addresses the motion for a conference was finally carried, and the sergeant-at-arms was directed to place the resolution in the hands of the Republican chairman.

William D. Lewis of the University of Pennsylvania read the draft of the Progressive platform. This was greeted with cheers, especially the planks dealing with preparedness and woman suffrage. A motion to adopt the platform was made, which was opposed by George W. Perkins, who asserted that it would be a mistake to take such action in view of the conference to be held with the Republican convention. There was some opposition to postponement, but following the announcement that a report had come from the Republican convention that it had decided not to adopt its platform for the present, action was deferred on the Progressive platform. A motion to adjourn until the following morning produced great disorder. Mr. Robbins refused to put the motion, and it was thereupon withdrawn. On receiving notice that the Republicans had appointed members of the conference committee the convention adjourned until 8 P. M. After a short session held at that hour in which the names of the conferees appointed by the Republicans were read, together with an exchange of communications between the two conventions, it was voted to adjourn until 10 o'clock on June 9th. The convention reconvened on June 9th and the unfinished business of adopting a platform was at once taken up. In view of the action taken on the preced-

ing day it was announced that merely the form of the paragraphs would be voted upon for adoption, leaving the question of actual adoption of the substance of the platform contingent upon the conference efforts. The reading of the platform was interrupted by George W. Perkins, who read the following report of the committee:

"Your committee appointed pursuant to the resolution adopted at yesterday's session had a conference with the committee representing the national Republican convention last evening.

"The conference was most friendly. Immediately upon assembling your committee proposed as the joint choice of both conventions the name of Theodore Roosevelt. The committee representing the Republican national convention did not present the name of any candidate nor did it attempt to refute our arguments relating to the unique availability of Theodore Roosevelt as a candidate to unite both parties or to serve our common country in this crucial period in the history of the world.

"After several hours of free discussion, during which no concrete opposition was advanced by the Republican conferees except that a further conference might be desirable this afternoon or evening, the joint committee adjourned."

Following this Mr. Perkins pointed out that the Progressive national committee should aim if possible to unite with the Republican convention as to a national candidate, and if that failed at least to have placed itself so strongly on record with the public that the people would unquestionably agree with the Progressives. He urged the delegates to be calm and to do nothing until further reports had been received from the conference committee. Other addresses were made by Hiram W. Johnson and John M. Parker. The latter said: "Your committee did all in its power. I fail to see the importance of keeping up the Progressive party and principles, but I believe with Mr. Johnson that we will not be able to go very far with those other gentlemen, and should therefore keep our powder dry and be prepared to act in the right time to nominate the one man who can be elected president of the United States." This was followed by another demonstration in favor of Mr. Roosevelt.

The reading of the platform was then resumed, but it was interrupted by the appearance in the convention hall of Senator Borah of Idaho, one of the most prominent leaders of the progressive wing of the Republican party. Senator Borah addressed the convention briefly, urging that the two conventions bear in mind that they had to decide the welfare and destiny of the American people for the next four years, and that this could be done only by working together. He said: "I would not discourage the enthusiasm you have for your leader, but would not be true to my convictions if I did not say that when we leave this city it is essential that we march and fight together in this great conflict." Senator Borah's address was received with great applause.

The afternoon session of the convention was occupied in deliberations over the platform. The greater part of the time was devoted to the question of the insertion of a nation-wide prohibition plank. It was finally voted to lay it on the table. After several addresses the

convention adjourned until the following morning. The session of June 10th was the most remarkable one of the convention, but it began more quietly than the preceding ones. It was called to order at 10.45 by Chairman Robbins, who announced that the convention would proceed with the regular business. Chester Lowell of California announced that a conference was in progress, and that no business should be transacted until the conferees had arrived in the convention hall. After a period of waiting Mr. Perkins arrived in the hall, and reported the result of the final conference of the joint conference committee. In effect he reported that the Republican conferees had agreed on Mr. Hughes and proposed that he be accepted for the Progressives. He reported also that the matter had been laid before Colonel Roosevelt at Oyster Bay, and there had been received from him a communication addressed to the conferees of the other party. In this communication Colonel Roosevelt suggested Senator Lodge of Massachusetts as a compromise candidate. He also urged the Progressive conferees to consider the statement made by Mr. Hughes accepting the Republican nomination, and if they found it acceptable his conditional refusal to accept the nomination would become absolute. The communications from Mr. Roosevelt were a distinct blow to the delegates. The suggestion of Senator Lodge's nomination was received with shouts of disapproval. It was finally voted to lay the communications on the table for a few moments. At 10.50 o'clock the chairman suddenly announced that he would entertain a motion for the nomination of President and Vice-President of the United States, and Bainbridge Colby was recognized. In a speech which lasted only three minutes he nominated Theodore Roosevelt. Reports from the Republican convention at this time showed that the delegates were taking a third ballot, which resulted in the nomination of Mr. Hughes. The nomination of Mr. Roosevelt was seconded by Governor Johnson of California, and following this a vote by acclamation was taken at 2.33 o'clock. Chairman Robbins announced that "Theodore Roosevelt is the Progressive candidate for President of the United States." Two hours previous to this Mr. Hughes had been nominated by the Republicans. John M. Parker of Louisiana was nominated for Vice-President. Shortly following the nomination of Mr. Roosevelt a telegram was received from him which read as follows:

"To the Progressive Convention: I am very grateful for the honor you confer upon me by nominating me as President. I cannot accept it at this time. I do not know the attitude of the candidate for the Republican party toward the vital question of the day.

"Therefore if you desire an immediate decision I must decline the nomination, but if you prefer it I suggest that my conditional refusal to run be placed in the hands of the Progressive national committee.

"If Mr. Hughes' statements when he makes them, shall satisfy the Progressive national committee that it is for the interest of the country that he be elected they can act accordingly, and treat my refusal as definitely accepted.

"If not satisfied, they can so notify the Progressive party, and at the same time they can confer with me, and then determine on whatever action we may severally deem appropriate to meet the needs of the country.

"THEODORE ROOSEVELT."

It was voted to receive the message in the spirit in which it was sent and to refer it to the national committee with power to act upon

it. This was carried, and the convention adjourned.

Immediately after the convention the session of the new national committee was held, in which the entire situation was gone over. The statement of Mr. Hughes was discussed, but no action was taken. It was decided to hold another meeting of the committee in Chicago on June 26th. It was announced by the chairman that should Colorado Republicans refuse to accept the nomination the committee would undoubtedly emphasize its power and fill the vacancy on the ticket. He insisted that there was no intention of giving up the party, and that it would have a standard bearer of its own.

**DEMOCRATIC CONVENTION.** The Democratic convention differed from both the Republican and Progressive in that there was at no time a doubt as to who would be the nominee for the presidency. As indicated in the sections dealing with the pre-convention campaigns, Mr. Wilson was the only candidate suggested, and no other was mentioned as a possibility.

Before the convention convened in St. Louis on June 14th, both the Progressive and Republican conventions had adjourned with their nominations made. Democratic leaders who had gathered in St. Louis prior to the meeting of the convention made no effort to conceal their disappointment at Colonel Roosevelt's refusal to accept the nomination, and the indications that the Progressive party as a party would support Hughes. This was increased when Mr. Hughes sent his telegram of acceptance which contained an aggressive attack upon Mr. Wilson's administration.

In the absence of any contest over the presidential nomination the chief issue involved was the platform. Mr. Baker, Secretary of War, arrived in St. Louis on June 13th with a draft of the platform which had been submitted to President Wilson, and which he had approved. Certain portions of the document Mr. Wilson had written himself. Among these were those which discussed peace and recommended the formation of a world's peace league. It was the intention of certain of the Democratic leaders to insert in the platform a plank condemning Mr. Hughes for resigning from the Supreme Court to become a candidate for the presidency. At the request of President Wilson this was omitted.

The most suggestive feature of the preliminaries to the convention was the practical elimination of Mr. Bryan as a conspicuous figure. In the several previous Democratic conventions he had been the outstanding figure, but his arrival at St. Louis on June 13th was scarcely noticed, and he took little or no active part in the proceedings.

There were several candidates for the vice-presidency, but Mr. Marshall had little opposition. The convention was called to order at noon on June 14th by William H. McCombs, chairman of the national committee. Prayer was offered by the Rev. James W. Lee, of St. Louis, and Martin H. Glynn, former Governor of New York, delivered his address as temporary chairman. The address was a eulogy of President Wilson and his administration, and was well received. The session adjourned following the delivery of this address.

It was the intention of the leaders of the convention to have the nominations for Presi-

dent and Vice-President made on June 16th or 17th. The absence of any important business other than these nominations made it difficult to induce the delegates to remain, and it was insisted that the nominations be made on June 15th. The second session of the convention convened at 11.50 A. M., and following the report of the committee on credentials, Senator Ollie James was chosen permanent chairman, and J. Bruce Kraemer, secretary. Senator James then delivered his address as permanent chairman. He made a severe arraignment of the Republican platform, and defended the actions of President Wilson in both domestic and foreign politics. He emphasized the work that the President had done as peace-maker. He praised the Federal Reserve act, and declared for a big army and navy. Toward the middle of his speech Senator James mentioned the President's name with particular emphasis. This was followed by a demonstration which lasted for 25 minutes. The delegates marched round the hall, carrying the iron standards which bore the State designations. It was suggestive that the New York delegates did not join in this demonstration. Senator James's address was followed by the report of the rules committee, which contained a resolution that the nominations be made before the platform was read. It was suggested that the convention take a recess until 8 P. M., that nominating speeches for President and Vice-President be heard then, and that the business of selecting the delegates be gotten out of the way before the adjournment of the night session. This indicated to the leaders that they could not hold the delegates over Friday. The session was finally adjourned until 9 P. M.

The approach of the night session found an immense crowd of persons besieging the doors of the Coliseum. As soon as the doors were opened the galleries were jammed to the danger point. Every available foot of space was occupied. There was much more cheering and excitement than had distinguished any other session. The session was called to order at 9.15 P. M. by Senator James. Mr. Bryan entered the hall, and there were instant demands for a speech, and following the prayer a resolution was placed by Senator Thompson of Kansas that Mr. Bryan be given the privileges of the floor. There were some dissenting votes, but the majority were in favor, and Mr. Bryan ascended the platform. In his speech he praised the domestic achievements of the Democratic party, the Federal Reserve act, the Income Tax law, and then uttered a glowing panegyric on President Wilson. He strongly defended the President's action in Mexico, and blamed the Mexican situation on the Republican party. He asserted that the country did not want intervention. He concluded his address with an appeal that President Wilson be given another chance.

At 10.16 P. M. Senator James ordered the roll call on the nomination for President. Alabama, the first State on the list, gave way to New Jersey, and John W. Wescott of that State placed Mr. Wilson in nomination. He performed this service in the convention in 1912. Mr. Wescott's speech was in general in line with those who had preceded him, and was almost entirely given over to eulogy of President Wilson and his administration. At 10.50 he placed the President's name in nomination before the convention. Seconding speeches were

made by Judson Harmon of Ohio and Governor Stewart of Virginia.

Mr. Marshall was placed in renomination for the vice-presidency by Senator Kern of Indiana. There were no seconding speeches. Shortly before midnight on June 15th, President Wilson and Vice-President Marshall were renominated by acclamation. In the voting for President there was one dissenter, Robert E. Burke, of Chicago. The vote therefore was 1092 to 1. Vice-President Marshall received the unanimous vote of the delegates. The convention on June 16th adopted the party platform, as approved by President Wilson. The platform will be found at the close of this section. Following the transaction of routine business, the convention adjourned.

**PROHIBITION NATIONAL CONVENTION.** The national convention of the Prohibition party met in St. Paul and held sessions from July 19th to July 21st. The candidates nominated for President were J. Frank Hanly, former Governor of Indiana, and for Vice-President Dr. Ira D. Landrith of Tennessee. Mr. Hanly was opposed for nomination by William Sulzer, former Governor of New York, who received 181 votes. The platform adopted by the convention was unusually important in that it emphasized many issues in addition to that of national prohibition of the liquor traffic. By the terms of the platform the party is committed to a strong opposition to the "wasteful military programme of the Democratic and Republican parties," to maintain an adequate defensive armament, but only until international coöperation can be secured "to dismantle navies and disband armies"; to avoid military intervention in Mexico; to support equal suffrage and the initiative, referendum, and recall; to public ownership of many public utilities; and to a broad programme of social justice.

#### THE PLATFORMS

The most extraordinary feature of the platforms the Republican and Democratic parties adopted in their respective conventions was their lack of diversity on most important questions. It would indeed be difficult for one reading the two platforms side by side to distinguish the Democratic from the Republican. Both platforms favor woman suffrage. The paragraphs differ only in phraseology. Both favor conservation. Both reaffirm the approval of the Monroe Doctrine. Both favor the national enforcement of the child labor law, and both heartily endorse the movement for national preparedness and an increase in the army and navy. The chief distinction between the two platforms is that the Democratic party praises without stint the administration of President Wilson, while the Republican asserts bitterly that it has been a shameful failure.

On certain subjects, however, the platforms differ. The most important of these are the tariff, the Philippines, the control of business, and the regulation of transportation, and merchant marine. Both parties favor the establishment of a tariff commission, but for different reasons. The Democratic party continues its assertion of belief in a tariff for revenue only, while the Republican insists on a tariff for protection to American industries and American labor. Both will use the tariff com-

mission for securing information necessary to revise the existing tariff in accordance with these underlying theories. The Democrats assert that the Underwood Tariff law has been a striking success, while the Republicans declare that it has been saved from utter failure only by the conditions created by the war. The Democratic platform endorses the declaration of the preamble to the proposed Philippine government bill, promising ultimate independence to the islands. The Republican platform insists that to leave the islands to self-government would be nothing short of perfidy; that it would break our pledges, injure our prestige among the nations, and imperil whatever has already been accomplished. The Democratic platform commends the establishment of a Federal trade commission, but makes no suggestions for new legislation dealing with the proposals for the regulation of business. The Republican platform makes a declaration for "rigid supervision and strict regulation of the great corporations of the country," and for the encouragement of American business, at the same time making the assertion that "business success no matter how honestly attained is apparently regarded by the Democratic party as in itself a crime." On the question of the control of transportation the Democratic platform says nothing, while the Republican platform says:

"The entire transportation system of the country has become essentially national. We, therefore, favor such action by legislation or, if necessary, through an amendment to the Constitution of the United States, as will result in placing it under exclusive Federal control."

The Democrats favor a government owned and operated merchant marine. The Republicans are entirely opposed to this policy, and declare in favor of "the payment to ships engaged in the foreign trade of liberal compensation for services actually rendered in carrying the mails, and such further legislation as will build up an adequate American merchant marine."

**REPUBLICAN PLATFORM.** Following is the platform adopted by the Republican national convention:

In 1861 the Republican party stood for the Union. As it stood for the union of the States, it now stands for a united people, true to American ideals, loyal to American traditions, knowing no allegiance except to the Constitution, to the Government, and to the flag of the United States. We believe in American policies at home and abroad.

#### PROTECTION OF AMERICAN RIGHTS

We declare that we believe in and will enforce the protection of every American citizen in all the rights secured to him by the Constitution, treaties, and the law of nations, at home and abroad, by land and sea. These rights, which, in violation of the specific promise of their party, made at Baltimore in 1912, the Democratic President and the Democratic Congress have failed to defend, we will unflinchingly maintain.

#### FOREIGN RELATIONS

We desire peace, the peace of justice and right, and believe in maintaining a straight and honest neutrality between the belligerents in the great war in Europe. We must perform all our duties and insist upon all our rights as neutrals, without fear and without favor. We believe that peace and neutrality, as well as the dignity and influence of the United States, cannot be preserved by shifting expedients, by phrasemaking, by performances in language or by attitudes ever changing in an effort to secure groups of voters.

The present administration has destroyed our influence abroad and humiliated us in our own eyes. The Republican party believes that a firm, consistent, and courageous foreign policy, always maintained by Repub-

lican Presidents in accordance with American traditions, is the best as it is the only true way to preserve our peace and restore us to our rightful place among the nations. We believe in the pacific settlement of international disputes and favor the establishment of a world court for that purpose.

#### MEXICO

We deeply sympathize with the fifteen million people of Mexico, who, for three years, have seen their country devastated, their homes destroyed, their fellow-citizens murdered and their women outraged by armed bands of desperadoes led by self-seeking, conscienceless agitators, who, when temporarily successful in any locality, have neither sought nor been able to restore order or establish and maintain peace.

We express our horror and indignation at the outrages which have been and are being perpetrated by these bandits upon American men and women, who were or are in Mexico by invitation of the laws and of the government of that country, and whose rights to security of person and property are guaranteed by solemn treaty obligations. We denounce the indefensible methods of interference employed by this administration in the internal affairs of Mexico, and refer with shame to its failure to discharge the duty of this country as next friend to Mexico, its duty to other Powers who have relied upon us as such friend, and its duty to our citizens in Mexico, in permitting the continuance of such conditions, first, by failure to act promptly and firmly, and secondly, by lending its influence to the continuation of such conditions through recognition of one of the factions responsible for these outrages.

We pledge our aid in restoring order and maintaining peace in Mexico. We promise to our citizens on and near our border, and to those in Mexico, wherever they may be found, adequate and absolute protection in their lives, liberty, and property.

#### MONROE DOCTRINE

We reaffirm our approval of the Monroe Doctrine, and declare its maintenance to be a policy of this country essential to its present and future peace and safety, and to the achievement of its manifest destiny.

#### LATIN AMERICA

We favor the continuation of Republican policies, which will result in drawing more and more closely the commercial, financial and social relations between this country and the countries of Latin America.

#### PHILIPPINES

We renew our allegiance to the Philippine policy inaugurated by McKinley, approved by Congress, and consistently carried out by Roosevelt and Taft. Even in this short time it has enormously improved the material and social conditions of the islands, given the Philippine people a constantly increasing participation in their Government, and, if persisted in, will bring still greater benefits in the future.

We accepted the responsibility of the islands as a duty to civilization and the Filipino people. To leave with our task half done would break our pledges, injure our prestige among nations, and imperil what already has been accomplished.

We condemn the Democratic Administration for its attempt to abandon the Philippines, which was prevented only by the vigorous opposition of Republican members of Congress, aided by a few patriotic Democrats.

#### RIGHT OF EXPATRIATION

We reiterate the unqualified approval of the action taken in December, 1911, by the President and Congress to secure with Russia, as with other countries, a treaty that will recognize the absolute right of expatriation and prevent all discrimination of whatever kind between American citizens, whether native-born or alien, and regardless of race, religion, or previous political allegiance. We renew the pledge to observe this principle and to maintain the right of asylum, which is neither to be surrendered nor restricted, and we unite in the cherished hope that the war which is now desolating the world may speedily end, with a complete and lasting restoration of brotherhood among the nations of the earth and the assurance of full equal rights, civil and religious, to all men in every land.

#### PROTECTION OF THE COUNTRY

In order to maintain our peace and make certain the security of our people within our own borders, the country must have not only adequate, but thorough and complete national defense, ready for any emergency. We must have a sufficient and effective regular army and a provision for ample reserves, already drilled and disciplined, who can be called at once to the colors when the hour of danger comes.

We must have a navy so strong and so well proper-



tioned and equipped, so thoroughly ready and prepared, that no enemy can gain command of the sea and effect a landing in force on either our Western or our Eastern coast. To secure these results we must have a coherent and continuous policy of national defense, which even in these perilous days the Democratic party has utterly failed to develop, but which we promise to give to the country.

#### TARIFF

The Republican party stands now, as always, in the fullest sense for the policy of tariff protection to American industries and American labor, and does not regard an anti-dumping provision as an adequate substitute. Such protection should be reasonable in amount, but sufficient to protect adequately American industry and American labor, and be so adjusted as to prevent undue exactions by monopolies or trusts. It should, moreover, give special attention to securing the industrial independence of the United States, as in the case of dyestuffs.

Through wise tariff and industrial legislation our industries can be so organized that they will become not only a commercial bulwark but a powerful aid to national defense.

The Underwood Tariff act is a complete failure in every respect. Under its administration, imports have enormously increased, in spite of the fact that the intercourse with foreign countries has been largely cut off by reason of the war, while the revenues, of which we stand in such dire need, have been greatly reduced. Under the normal conditions which prevailed prior to the war, it was clearly demonstrated that this act deprived the American producer and the American wage-earner of that protection which entitled them to meet their foreign competitors, and, but for the adventitious conditions created by the war, would long since have paralyzed all forms of American industry and deprived American labor of its just reward.

It has not in the least reduced the cost of living, which has constantly advanced from the date of its enactment. The welfare of our people demands its repeal and the substitution of a measure which, in peace, as well as in war, will produce ample revenue and give reasonable protection to all forms of American production in mine, forest, field and factory.

We favor the creation of a Tariff Commission, with complete power to gather and compile information for the use of Congress in all matters relating to the tariff.

#### BUSINESS

The Republican party has long believed in the rigid supervision and strict regulation of the transportation and great corporations of the country. It has put its creed into its deeds, and all really effective laws regulating the railroads and the great industrial corporations are the work of Republican Congresses and Presidents. For this policy of regulation and supervision the Democrats, in a stumbling and piecemeal way, are undertaking to involve the Government in business which should be left within the sphere of private enterprise and indirect competition with its own citizens, a policy which is sure to result in waste, great expense to the taxpayer, and in an inferior product.

The Republican party firmly believes that all who violate the laws in regulation of business should be individually punished. But prosecution is very different from persecution, and business success, no matter how honestly attained, is apparently regarded by the Democratic party as in itself a crime. Such doctrines and beliefs choke enterprise and stifle prosperity. The Republican party believes in encouraging American business, as it believes in and will seek to advance all American interests.

#### RURAL CREDITS

We favor an effective system of rural credits as opposed to the ineffective law proposed by the present Democratic Administration.

#### RURAL FREE DELIVERY

We favor the extension of the rural free delivery system and condemn the Democratic Administration for curtailing and crippling it.

#### MERCHANT MARINE

In view of the policies adopted by all the maritime nations to encourage their shipping interests, and in order to enable us to compete with them for the ocean-carrying trade, we favor the payment to ships engaged in the foreign trade of liberal compensation for services actually rendered in carrying the mails, and such further legislation as will build up an adequate American merchant marine and give us ships which may be requisitioned by the Government in time of national emergency.

We are utterly opposed to the Government ownership of vessels, as proposed by the Democratic party, because Government-owned ships, while effectively preventing the development of the American merchant marine by private capital, will be entirely unable to provide for the vast

volume of American freights, and will leave us more helpless than ever in the hard grip of foreign syndicates.

#### RAILROADS

Interstate and intrastate transportation has become so interwoven that the attempt to apply two, and often several, sets of laws to its regulation has produced conflicts of authority, embarrassment in operation, and inconvenience and expense to the public.

The entire transportation system of the country has become essentially national. We, therefore, favor such action by legislation, or, if necessary, through an amendment to the Constitution of the United States, as will result in placing it under exclusive Federal control.

#### ECONOMY AND A NATIONAL BUDGET

The increasing cost of the National Government, and the need for the greatest economy of its resources, in order to meet the growing demands of the people for Government service, call for the severest condemnation of the wasteful appropriations of this Democratic Administration, of its shameless raids on the treasury, and of its opposition to and rejection of President Taft's oft-repeated proposals and earnest efforts to secure economy and efficiency through the establishment of a simple, businesslike budget system, to which we pledge our support, and which we hold to be necessary to effect a needed reform in the administration of national finances.

#### CONSERVATION

We believe in a careful husbandry of all the natural resources of the Nation—a husbandry which means development without waste, use without abuse.

#### CIVIL SERVICE REFORM

The Civil Service Law has always been sustained by the Republican party, and we renew our repeated declaration that it shall be thoroughly and honestly enforced and extended wherever practicable. The Democratic party has created since March 4, 1913, 30,000 offices outside of the Civil Service Law, at an annual cost of \$44,000,000 to the taxpayers of the country.

We condemn the gross abuse and the misuse of the law by the present Democratic Administration and pledge ourselves to a reorganization along lines of efficiency and economy.

#### TERRITORIAL OFFICIALS

Reaffirming the attitude long maintained by the Republican party, we hold that officials appointed to administer the Government of any territory should be bona-fide residents of the territory in which their duties are to be performed.

#### LABOR LAWS

We pledge the Republican party to the faithful enforcement of all Federal laws passed for the protection of labor. We favor vocational education, the enactment and rigid enforcement of a Federal child labor law, the enactment of a generous and comprehensive workmen's compensation law, within the commerce power of Congress, and an accident compensation law covering all Government employees. We favor the collection and collation under the direction of the Department of Labor of complete data relating to industrial hazards for the information of Congress, to the end that such legislation may be adopted as may be calculated to secure the safety, conservation, and protection of labor from the dangers incident to industry and transportation.

#### SUFFRAGE

The Republican party, reaffirming its faith in Government of the people, by the people, for the people, as a measure of justice to one-half of the adult people of this country, favors the extension of the suffrage to women, but recognizing the right of each State to settle this question for itself.

Such are our principles, such are our purposes and policies. We close as we began. The times are dangerous, and the future is fraught with peril. The great issues of the day have been confused by words and phrases. The American spirit which made the country and saved the Union has been forgotten by those charged with the responsibility of power. We appeal to all Americans, whether naturalized or native born, to prove to the world that we are Americans in thought and in deed, with one loyalty, one hope, one aspiration. We call on all Americans to be true to the spirit of America; to the great traditions of their common country, and, above all things, to keep the faith.

**DEMOCRATIC PLATFORM.** The platform adopted by the Democratic national convention is as follows:

#### PREAMBLE

The Democratic party, in National Convention assembled, adopts the following declaration to the end that

the people of the United States may both realize the achievements wrought by four years of Democratic administration and be apprised of the policies to which the party is committed for the further conduct of national affairs.

#### RECORD OF ACHIEVEMENT

We indorse the administration of Woodrow Wilson. It speaks for itself. It is the best exposition of sound Democratic policy at home and abroad.

We challenge comparison of our record, our keeping of pledges and our constructive legislation with those of any party of any time.

We found our country hampered by special privilege, a vicious tariff, obsolete banking laws and an inelastic currency. Our foreign affairs were dominated by commercial interests for their selfish ends. The Republican party, despite repeated pledges, was impotent to correct abuses which it had fostered. Under our administration, under a leadership which has never faltered, these abuses have been corrected, and our people have been freed therefrom.

Our archaic banking and currency system, prolific of panic and disaster under Republican Administrations—long the refuge of the Money Trust—has been supplanted by the Federal Reserve Act, a true democracy of credit under Government control, already proved a financial bulwark in a world crisis, mobilising our resources, placing abundant credit at the disposal of legitimate industry, and making a currency panic impossible. We have created a Federal Trade Commission to accommodate the perplexing questions arising under the Anti-Trust Laws, so that monopoly may be strangled at its birth and legitimate industry encouraged. Fair competition in business is now assured.

We have effected an adjustment of the tariff, adequate for revenue under peace conditions, and fair to the consumer and to the producer. We have adjusted the burdens of taxation so that swollen incomes bear their equitable shares. Our revenues have been sufficient in times of world stress, and will largely exceed the expenditures for the current fiscal year.

We have lifted human labor from the category of commodities, and have secured to the working man the right of voluntary association for his protection and welfare; we have protected the rights of the laborer against the unwarranted issuance of writs of injunction, and have guaranteed to him the right of trial by jury in case of alleged contempt committed outside the presence of the court.

We have advanced the parcel post to genuine efficiency, enlarged the postal savings system, added 10,000 rural delivery routes and extensions, thus reaching 2,250,000 additional people, improved the postal service in every branch, and for the first time in our history placed the post-office system on a self-supporting basis, with actual surplus in 1913, 1914 and 1916.

#### ECONOMIC FREEDOM

The reforms which were most obviously needed to clear away privilege, prevent unfair discrimination, and release the energies of men of all ranks and advantages, have been effected by recent legislation. We must now remove, so far as possible, every remaining element of unrest and uncertainty from the path of the business men of America and secure for them a continued period of quiet, assured and confident prosperity.

#### TARIFF

We reaffirm our belief in the doctrine of a tariff for the purpose of providing sufficient revenue for the operation of the Government economically administered, and unreservedly indorse the Underwood Tariff Law as truly exemplifying that doctrine. We recognize that tariff rates are necessarily subject to change to meet changing conditions in the world's production and trade. The events of the last two years have brought about many momentous changes. In some respects their effects are yet conjectural and wait to be disclosed, particularly in regard to our foreign trade.

Two years of a war which has directly involved most of the chief industrial nations of the world, and which has indirectly affected the life and industry of all nations, are bringing about economic changes more varied and far reaching than the world has ever before experienced. In order to ascertain just what those changes may be, the Democratic Congress is providing for a non-partisan tariff commission to make impartial and thorough study of every economic fact that may throw light either upon our past or upon our future fiscal policy with regard to the imposition of taxes on imports or with regard to the changed and changing conditions under which our trade is carried on. We cordially indorse this timely proposal and declare ourselves in sympathy with the principle and purpose of shaping legislation within that field in accordance with clearly established facts rather than in accordance with the demands of selfish interests

or upon information provided largely, if not exclusively, by them.

#### AMERICANISM

The part the United States will play in the new day of international relationships which is now upon us will depend upon our preparation and our character. The Democratic party therefore recognizes the assertion and triumphant demonstration of the indivisibility and coherent strength of the Nation as the supreme issue of this day, in which the whole world faces the crisis of manifold change. It summons all men, of whatever origin or creed, who would count themselves Americans, to join in making clear to all the world the unity and consequent power of America.

This is an issue of patriotism. To taint it with partisanship would be to defile it. In this day of test America must show itself not a Nation of partisans, but a Nation of patriots. There is gathered here in America the best of the blood, the industry and the genius of the whole world, the elements of a great race, and a magnificent society to be melted into a mighty and splendid nation.

Whoever, actuated by the purpose to promote the interest of a foreign power in disregard of our own country's welfare or to injure this Government in its foreign relations or cripple or destroy its industries at home, and whoever, by arousing prejudices of a racial, religious or other nature, creates discord and strife among our people so as to obstruct the wholesome process of unification, is faithless to the trust which the privileges of citizenship repose in him and disloyal to his country.

We, therefore, condemn as subversive of this Nation's unity and integrity, and as destructive of its welfare, the activities and designs of every group or organization, political or otherwise, that has for its object the advancement of the interest of a foreign power, whether such object is promoted by intimidating the Government, a political party, or representatives of the people, or which is calculated and tends to divide our people into antagonistic groups, and thus to destroy that complete agreement and solidarity of the people, and that unity of sentiment and national purpose so essential to the perpetuity of the Nation and its free institutions.

We condemn all alliances and combinations of individuals in this country, of whatever nationality or descent, who agree and conspire together for the purpose of embarrassing or weakening our Government or of improperly influencing or coercing our public representatives, in dealing or negotiating with any foreign power.

We charge that such conspiracies among a limited number exist, and have been instigated for the purpose of advancing the interests of foreign countries to the prejudice and detriment of our own country. We condemn any political party which, in view of the activity of such conspirators, surrenders its integrity or modifies its policy.

#### PREPAREDNESS

Along with the proof of our character as a Nation must go the proof of our power to play the part that legitimately belongs to us. The people of the United States love peace. They respect the rights and covet the friendship of all other nations. They desire neither any additional territory nor any advantage which cannot be peacefully gained by their skill, their industry or their enterprise; but they insist upon having absolute freedom of national life and policy, and feel that they owe it to themselves, and to the rôle of spirited independence which it is their sole ambition to play, that they should render themselves secure against the hazard of interference from any quarter, and should be able to protect their rights upon the seas or in any part of the world.

We therefore favor the maintenance of an army fully adequate to the requirements of order, of safety and of the protection of the Nation's rights, the fullest development of modern methods of seacoast defense, and the maintenance of an adequate reserve of citizens trained to arms and prepared to safeguard the people and territory of the United States against any danger of hostile action which may unexpectedly arise, and a fixed policy for the continuous development of a navy worthy to support the great naval traditions of the United States, and fully equal to the international tasks which the United States hopes and expects to take a part in performing. The plans and enactments of the present Congress afford substantial proof of our purpose in this exigent matter.

#### INTERNATIONAL RELATIONS

The Democratic Administration has throughout the present war scrupulously and successfully held to the old paths of neutrality and of the peaceful pursuit of the legitimate objects of our national life, which statesmen of all parties and creeds have prescribed for themselves in America since the beginning of our history. But the circumstances of the last two years have revealed necessities of international action which no former generation can have foreseen.

We hold that it is the duty of the United States to use its power not only to make itself safe at home but also to make secure its just interests throughout the world, and both for this end and in the interest of humanity to assist the world in securing settled peace and justice.

We believe that every people has the right to choose the sovereignty under which it shall live; that the small states of the world have a right to enjoy from other nations the same respect for their sovereignty and for their territorial integrity that great and powerful nations expect and insist upon, and that the world has a right to be free from every disturbance of its peace that has its origin in aggression or disregard of the rights of peoples and nations, and we believe that the time has come when it is the duty of the United States to join with the other nations of the world in any feasible association that will effectively serve these principles, to maintain inviolate the complete security of the highway of the seas for the common and unhindered use of all nations.

The present administration has consistently sought to act upon and realize in its conduct of the foreign affairs of the Nation the principle that should be the object of any association of the nations formed to secure the peace of the world and the maintenance of national and individual right. It has followed the highest American traditions.

It has preferred respect for the fundamental rights of smaller states, even to property interests, and has secured the friendship of the people of these states for the United States by refusing to make a more material interest an excuse for the assertion of our superior power against the dignity of their sovereign independence.

It has regarded the lives of its citizens and the claims of humanity as of greater moment than material rights, and peace as the best basis for the just settlement of commercial claims. It has made the honor and ideals of the United States its standard alike in negotiation and action.

#### PAN-AMERICAN CONCORD

We recognize now, as we have always recognized, a definite and common interest between the United States with the other peoples and republics of the Western Hemisphere in all matters of national independence and free political development. We favor the establishment and maintenance of the closest relations of amity and mutual helpfulness between the United States and the other republics of the American continents for the support of peace and the promotion of a common prosperity. To that end we favor all measures which may be necessary to facilitate intimate intercourse and promote commerce between the United States and her neighbors to the south of us, and such international understandings as may be practicable and suitable to accomplish these ends.

We commend the action of the Democratic Administration in holding the Pan-American Financial Conference at Washington in May, 1915, and organizing the International High Commission, which represented the United States in the recent meeting of representatives of the Latin-American republics at Buenos Aires, April, 1916, which have so greatly promoted the friendly relations between the people of the Western Hemisphere.

#### MEXICO

The Monroe Doctrine is reasserted as a principle of Democratic faith. That doctrine guarantees the independent republics of the two Americas against aggression from another continent. It implies as well the most scrupulous regard upon our part for the sovereignty of each of them.

The want of a stable, responsible government in Mexico, capable of repressing and punishing marauders and bandit bands, who have not only taken the lives and seized and destroyed the property of American citizens in that country, but have insolently invaded our soil, made war upon and murdered our people thereon, has rendered it necessary temporarily to occupy, by our armed forces, a portion of the territory of that friendly state, where until by the restoration of law and order therein, a repetition of such incursions is improbable, the necessity for their remaining will continue.

Intervention, implying as it does military subjugation, is revolting to the people of the United States, notwithstanding the provocation to that course has been great, and should be resorted to, if at all, only as a last resort. The stubborn resistance of the President and his advisers to every demand and suggestion to enter upon it, is creditable alike to them and to the people in whose name he speaks.

#### MERCHANT MARINE

Immediate provision should be made for the development of the carrying trade of the United States. Our foreign commerce has in the past been subject to many unnecessary and vexatious obstacles in the way of legislation of Republican Congresses. Until the recent Democratic tariff legislation, it was hampered by unreasonable

burdens of taxation. Until the recent banking legislation it had at its disposal few of the necessary instrumentalities of international credit and exchange. Until the formulation of the pending act to promote the construction of a merchant marine it lacked even the prospect of adequate carriage by sea.

We heartily indorse the purposes and policy of the pending Shipping Bill and favor all such additional measures of constructive or remedial legislation as may be necessary to restore our flag to the seas and to provide further facilities for our foreign commerce, particularly such laws as may be made to remove unfair conditions of competition in the dealings of American merchants and producers with competitors in foreign markets.

#### CONSERVATION

For the safeguarding and quickening of the life of our own people, we favor the conservation and development of the natural resources of the country by means of a policy which shall be positive rather than negative, a policy which shall not withhold such resources from development, but which, while permitting and encouraging their use, shall prevent both waste and monopoly in their exploitation, and we earnestly favor the passage of acts which will accomplish these objects, and we reaffirm the declaration of the platform of 1912 on this subject. The policy of reclaiming our arid lands should be steadily adhered to.

#### THE ADMINISTRATION AND THE FARMER

We favor the vigorous prosecution of investigation and plans to render agriculture more profitable and country life more healthful, comfortable and attractive, and we believe that this should be a dominant aim of the Nation as well as of the States. With all its recent improvement, farming still lags behind other occupations in development as a business, and the advantages of an advancing civilization have not accrued to rural communities in a fair proportion.

Much has been accomplished in this field under the present administration—far more than under any previous administration. In the Federal Reserve Act of the last Congress and the Rural Credits Act of the present Congress, the machinery has been created which will make credit available to the farmer constantly and readily, and he has at last been put upon a footing of equality with the merchant and the manufacturer in securing the capital necessary to carry on his enterprises. Grades and standards necessary to the intelligent and successful conduct of the business of agriculture have also been established, or are in the course of establishment by law.

The long needed Cotton Futures Act, passed by the Sixty-third Congress, has now been in successful operation for nearly two years. A Grain Grades Bill, long needed, and a Permissive Warehouse Bill, intended to provide better storage facilities and to enable the farmer to obtain certificates upon which he may secure advances of money, have been passed by the House of Representatives, have been favorably reported to the Senate and will probably become law during the present session of Congress. Both Houses have passed a good roads measure, which will be of far reaching benefit to all agricultural communities.

Above all, the most extraordinary and significant progress has been made, under the direction of the Department of Agriculture, in extending and perfecting practical farm demonstration work, which is so rapidly substituting scientific for empirical farming. But it is also necessary that rural activities should be better directed through coöperation and organization, that unfair methods of competition should be eliminated, and the conditions requisite for the just, orderly and economical marketing of farm products created. We approve the Democratic administration for having emphatically directed attention for the first time to the essential interests of agriculture involved in farm marketing and finance, for creating the office of markets and rural organization in connection with the Department of Agriculture, and for extending the coöperative machinery necessary for conveying information to farmers by means of demonstrations. We favor continued liberal provision not only for the benefit of production, but also for the study and solutions of problems of farm marketing and finance, and for the extension of existing agencies for improving country life.

#### GOOD ROADS

The happiness, comfort and prosperity of rural life and the development of the city are alike conserved by the construction of public highways. We therefore favor national aid in the construction of post roads and roads for military purposes.

#### GOVERNMENT EMPLOYMENT

We hold that the life, health and strength of the men, women and children of the nation are its greatest asset and that in the conservation of these the Federal Gov-

ernment, wherever it acts as the employer of labor, should both on its own account and as an example, put into effect the following principles of just employment:

- (1) A living wage for all employees.
- (2) A working day not to exceed eight hours, with one day of rest in seven.
- (3) The adoption of safety appliances and the establishment of thoroughly sanitary conditions of labor.
- (4) Adequate compensation for industrial accidents.
- (5) The standards of the Uniform Child Labor Law wherever minors are employed.
- (6) Such provisions for decency, comfort and health in the employment of women as should be accorded the mothers of the race.
- (7) An equitable retirement law providing for the retirement of superannuated and disabled employees of the civil service, to the end that a higher standard of efficiency may be maintained.

We believe also that the adoption of similar principles should be urged and applied in the legislation of the States with regard to labor within their borders, and that through every possible agency the life and health of the people of the nation should be conserved.

**LABOR**

We declare our faith in the Seamen's Act, passed by the Democratic Congress, and we promise our earnest continuance of its enforcement.

We favor the speedy enactment of an effective Federal Child Labor Law and the regulation of the shipment of prison-made goods in interstate commerce.

We favor the creation of a Federal Bureau of Safety in the Department of Labor, to gather facts concerning industrial hazards and to commend legislation concerning the maiming and killing of human beings.

We favor the extension of the powers and functions of the Federal Bureau of Mines.

We favor the development upon a systematic scale of the means already begun under the present administration, to assist laborers throughout the nation to seek and obtain employment, and the extension by the Federal Government of the same assistance and encouragement as is now given to agricultural training.

We heartily recommend our newly established Department of Labor for its excellent record in settling industrial strikes by personal advices and through conciliating agents.

**PUBLIC HEALTH**

We favor a thorough consideration of the means and methods by which the Federal Government handles questions of public health, to the end that human lives may be conserved by the elimination of loathsome disease, the improvement of sanitation and the diffusion of a knowledge of disease prevention.

We favor the establishment by the Federal Government of tuberculosis sanitariums for needy tubercular patients.

**SENATE RULES**

We favor such an alteration of the rules of procedure of the Senate of the United States as will permit the prompt transaction of the Nation's legislative business.

**ECONOMY AND THE BUDGET**

We demand careful economy in all expenditures for the support of the Government, and to that end favor a return by the House of Representatives to its former practice of initiating and preparing all appropriation bills through a single committee chosen from its membership, in order that responsibility may be centred, expenditure standardized and made uniform, and waste and duplication in the public service as much as possible avoided. We favor this as a practicable first step toward a budget system.

**CIVIL SERVICE**

We reaffirm our declaration for the rigid enforcement of the civil service laws.

**PHILIPPINE ISLANDS**

We heartily indorse the provisions of the bill recently passed by the House of Representatives further promoting self-government in the Philippine Islands, as being in fulfillment of the policy declared by the Democratic party in its last national platform, and we reiterate our endorsement of the purpose of ultimate independence for the Philippine Islands expressed in the preamble of that measure.

**WOMAN SUFFRAGE**

We recommend the extension of the franchise to the women of the country by the States upon the same terms as to men.

**PROTECTION OF CITIZENS**

We again declare the policy that the sacred right of American citizenship must be preserved at home and abroad, and that no treaty with any other Government shall receive the sanction of our Government which does

not expressly recognize the absolute equality of all our citizens, irrespective of race, creed or previous nationality, and which does not recognize the right of expatriation. The American Government should protect American citizens in their right not only at home but abroad, and any country having a Government should be held to strict accountability for any wrongs done them, either to person or property.

At the earliest practical opportunity, our country should strive earnestly for peace among the warring nations of Europe and seek to bring about the adoption of the fundamental principle of justice and humanity, that all men shall enjoy equality of right and freedom from discrimination in the lands wherein they dwell.

**PRISON REFORM**

We demand that the modern principles of prison reform be applied in our Federal penal system. We favor such work for prisoners as shall give them training in remunerative occupations, so that they may make an honest living when released from prison; the setting apart of the net wages of the prisoner to be paid to his dependent family or to be reserved for his own use upon his release; the liberal extension of the principles of the Federal Parole Law, with due regard both to the welfare of the prisoner and the interests of society; the adoption of the probation system, especially in the case of first offenders not convicted of serious crimes.

**PENSIONS**

We renew the declaration of recent Democratic platforms relating to generous pensions for soldiers and their widows, and call attention to our record of performance in this particular.

**WATERWAY AND FLOOD CONTROL**

We renew the declaration in our last two platforms relating to the development of our waterways. The recent devastation of the Lower Mississippi Valley and several other sections by floods accentuates the movement for the regulation of river flow by additional bank and levee protection below, and diversion storage and control of the flood waters above, and their utilization for beneficial purposes in the reclamation of arid and swamp lands, and development of water power, instead of permitting the floods to continue, as heretofore, agents of destruction.

We hold that the control of the Mississippi River is a national problem. The preservation of the depth of its waters for purposes of navigation, the building of levees and works of bank protection to maintain the integrity of its channel and prevent the overflow of its valley, resulting in the interruption of interstate commerce, the disorganization of the mail service and the enormous loss of life and property, impose an obligation which alone can be discharged by the National Government.

We favor the adoption of a liberal and comprehensive plan for the development and improvement of our harbors and inland waterways with economy and efficiency, so as to permit their navigation by vessels of standard draught.

**ALASKA**

It has been and will be the policy of the Democratic party to enact all laws necessary for the speedy development of Alaska and its great natural resources.

**TERRITORIES**

We favor granting to the people of Alaska, Hawaii and Porto Rico the traditional Territorial Government accorded to all Territories of the United States since the beginning of our Government and we believe the officials appointed to administer the Government of these several Territories should be qualified by previous bona-fide residence.

**CANDIDATES**

We unreservedly indorse our President and Vice-President, Woodrow Wilson of New Jersey, and Thomas Riley Marshall of Indiana, who have performed the functions of their great offices faithfully and impartially and with distinguished ability.

In particular we commend to the American people the splendid diplomatic victories of our great President, who has preserved the vital interests of our Government and its citizens and kept us out of war.

Woodrow Wilson stands to-day the greatest American of his generation.

**CONCLUSION**

This is a critical hour in the history of America, a critical hour in the history of the world. Upon the record above set forth, which shows great constructive achievement in following out a consistent policy for our domestic and internal development; upon the record of the Democratic Administration, which maintained the honor, the dignity, and the interests of the United States and at the same time retained the respect and friendship of all the nations of the world, and upon the great policies

for the future strengthening of the life of our country, the enlargement of our national vision and the ennobling of our international relations, as set forth above, we appeal with confidence to the voters of the country.

### III. POST-CONVENTION CAMPAIGNS

**REPUBLICAN POST-CONVENTION CAMPAIGN.** Mr. Hughes lost no time in entering upon the active work of the campaign. As soon as he had been notified of his nomination he sent a letter to President Wilson resigning his position on the Supreme Court bench, and this was at once accepted. He came to New York City following this, and consulted with the leaders of the party in laying out the broad lines of the campaign. On June 27th William R. Willcox, former postmaster of New York City, was chosen chairman of the Republican national committee to manage the campaign. Cornelius N. Bliss, Jr., was chosen treasurer. On the following day Mr. Hughes and Colonel Roosevelt dined together and had a long conference in regard to campaign issues and plans. Colonel Roosevelt expressed satisfaction at the end of this interview, and put an end finally to any doubts as to whether he would support Mr. Hughes.

On July 31st Mr. Hughes was officially notified of his nomination. In a speech he severely scored the Wilson administration.

The most notable portions of his address follow:

"We desire that the Republican party as a great liberal party shall be the agency of national achievement, the organ of the effective expression of dominant Americanism. What do I mean by that? I mean America conscious of power, awake to obligation, erect in self-respect, prepared for every emergency, devoted to the ideals of peace, instinct with the spirit of human brotherhood, safeguarding both individual opportunity and the public interest, maintaining a well-ordered constitutional system adapted to local self-government without the sacrifice of essential national authority, appreciating the necessity of stability, expert knowledge and thorough organization as the indispensable conditions of security and progress; a country loved by its citizens with a patriotic fervor permitting no division in their allegiance and no rivals in their affection—I mean America first and America efficient.

"The dealings of the administration with Mexico constitute a confused chapter of blunders. We have not helped Mexico. She lies prostrate, impoverished, famine-stricken, overwhelmed with the woes and outrages of internecine strife, the helpless victim of a condition of anarchy which the course of the administration only served to promote. For ourselves, we have witnessed the murder of our citizens and the destruction of their property. We have made enemies, not friends.

"In the light of the conduct of the administration no one could understand its professions. Decrying interference, we interfered most exasperatingly. We have not even kept out of actual conflict, and the soil of Mexico is stained with the blood of our soldiers. We have resorted to physical invasion, only to retire without gaining the professed object. It is a record which cannot be examined without a profound sense of humiliation.

"The nation has no policy of aggression toward Mexico. We have no desire for any part of her territory. We wish her to have peace, stability and prosperity. . . . We demand from Mexico the protection of the lives and the property of our citizens and the security of our border from depredations. Much will be gained if Mexico is convinced that we contemplate no meddlesome interference with what does not concern us, but that we propose to insist in a firm and candid manner upon the performance of international obligations. To a stable government, appropriately discharging its international duties, we should give ungrudging support. A short period of firm, consistent and friendly dealing will accomplish more than many years of vacillation.

"The chief function of diplomacy is prevention; but in this our diplomacy failed, doubtless because of its impaired credit and the manifest lack of disposition to back words with action. Had this government by the use of both informal and formal diplomatic opportunities left no doubt that when we said 'strict accountability' we

meant precisely what we said, and that we should unhesitatingly vindicate that position, I am confident that there would have been no destruction of American lives by the sinking of the *Lusitania*.

"It is a great mistake to say that resoluteness in protecting American rights would have led to war. Rather, in that course lay the best assurance of peace.

"We denounce all plots and conspiracies in the interest of any foreign nation. Utterly intolerable is the use of our soil for alien intrigues. Every American must unreservedly condemn them, and support every effort for their suppression. But here, also, prompt, vigorous, and adequate measures on the part of the administration were needed. There should have been no hesitation; no notion that it was wise and politic to delay.

"It is apparent that we are shockingly unprepared. There is no room for controversy on this point since the object lesson on the Mexican border. All our available regular troops (less, I believe, than 40,000) are there or in Mexico, and as these have been deemed insufficient the entire National Guard has been ordered out; that is, we are summoning practically all our movable military forces in order to prevent bandit incursions.

"In the demand for reasonable preparedness the administration has followed, not led. Those who demanded more adequate forces were first described as 'nervous and excited.'

"Later, under the pressure of other leadership, this attitude was changed. The administration, it was said, had 'learned something,' and it made a belated demand for an increased army.

"It seems to be plain that our regular army is too small. We are too great a country to require of our citizens who are engaged in peaceful vocations the sort of military service to which they are now called. As well insist that our citizens in this metropolis be summoned to put out fires and police the streets.

"There should be not only a reasonable increase in the regular army, but the first citizen reserve subject to call should be enlisted as a Federal army and trained under Federal authority.

"We are deeply interested in what I may term the organization of peace. We cherish no illusions. We know that the recurrence of war is not to be prevented by pious wishes. If the conflict of national interests is not to be brought to the final test of force, there must be the development of international organization in order to provide international justice and to safeguard so far as practicable the peace of the world.

"There should be an international tribunal to decide controversies susceptible of judicial determination.

"We need conferences of the nations to formulate international rules, to establish principles, to modify and extend international law so as to adapt it to new conditions, to remove causes of international differences. We need to develop the instrumentalities of conciliation.

"And behind this international organization, if it is to be effective, must be the cooperation of the nations to prevent resort to hostilities before the appropriate agencies of peaceful settlement have been utilized.

"It is only through international cooperation giving a reasonable assurance of peace that we may hope for the limitation of armaments. It is to be expected that nations will continue to arm in defense of their respective interests, as they are conceived, and nothing will avail to diminish this burden save some practical guaranty of international order.

"When we contemplate industrial and commercial conditions, we see that we are living in a fool's paradise. The temporary prosperity to which our opponents point has been created by the abnormal conditions incident to the war.

"Our opponents promised to reduce the cost of living. This they have failed to do; but they did reduce the opportunities of making a living.

"The Republican party stands for the principle of protection. We must apply that principle fairly, without abuses, in as scientific a manner as possible; and Congress should be aided by the investigations of an expert body. We stand for the safeguarding of our economic independence, for the development of American industry, for the maintenance of American standards of living. We propose that in the competitive struggle that is about to come the American workman shall not suffer.

"We must build up our merchant marine. It will not aid to put the Government into competition with private owners. That, it seems to me, is a counsel of folly.

"We stand for the conservation of the just interests of labor. We do not desire production, or trade, or efficiency in either, for its own sake, but for the betterment of the lives of human beings. We shall not have any lasting industrial prosperity, unless we buttress our industrial endeavors by adequate means for the protection of health; for the elimination of unnecessary perils to life and limb; for the safeguarding of our future through proper laws for protection of women and children in industry; for increasing opportunities for education and training. We should be solicitous to inquire carefully

into every grievance, remembering that there are few disputes which cannot easily be adjusted if there be an impartial examination of the facts. We make common cause in this country, not for a few, but for all; and our watchword must be cooperation, not exploitation. No plans will be adequate save as they are instinct with genuine democratic sympathy.

"I endorse the declaration in the platform in favor of woman suffrage.

"Our opponents promised economy, but they have shown a reckless extravagance. They have been wasteful and profligate. It is time that we had fiscal reform. We demand a simple business-like budget. I believe it is only through a responsible budget, proposed by the executive, that we shall avoid financial waste and secure proper administrative efficiency, and a well-balanced consideration of new administrative proposals."

Mr. Hughes had dealt, as will be noted in this speech, with the subject of woman suffrage. On the day following the deliverance of the speech he supplemented his remarks by another statement, in which he made it clear that he had not gone further in his former address because he felt constrained at that time to speak only of matters set forth in the party platform. In his supplementary statement he declared his support of the Anthony amendment to the Constitution, providing for national woman suffrage.

"I see nothing but danger to our security, to our unity, to our proper attitude toward political questions in continual agitation of the subject; and I would take the shortest cut to this solution.

"I further believe that it is a matter affecting the whole country. It is one of those matters where we must have a uniform policy. The country must decide on what that policy must be. I have indicated my belief as to what it should be; but it is a question that affects the whole country—the composition of our electorate; and therefore I believe that the Federal amendment should be submitted and should be ratified."

Several days after the delivery of his speech of acceptance Mr. Hughes began his first speaking tour, which occupied a month, and took him through 17 States from East to West. His first address was delivered in Detroit, and was followed by addresses in Chicago, St. Paul, Fargo, N. D., and other cities and towns in the Western States. In each of these addresses Mr. Hughes vigorously attacked the Wilson administration on the grounds of waste, extravagance, sectionalism, unfit appointments, violation of civil service principles, and a weak foreign policy. In connection with the civil service Mr. Hughes made the charge that E. Dana Durand, former head of the Census Bureau, had been forced out of his position because it was wanted for a Democrat. This charge was promptly denied by Secretary Redfield, who maintained that Mr. Durand had retired voluntarily. On the following day Mr. Hughes read a letter from Mr. Durand himself, in which the latter declared that the charge was true, and that he had been forced to resign, because the administration wished to create a vacancy.

In an address delivered at Kansas City, on September 1st, Mr. Hughes pleaded for a larger army and navy. He spoke at St. Louis on September 2nd, declaring arbitrary legislation "a surrender of principle to force." This allusion was directed toward the passage at Mr. Wilson's insistence of the so-called Adamson law. On September 1st he spoke at Syracuse, N. Y.,

urging the protection of labor by new tariff legislation. September 5th he spoke at Lexington, Ky., and Cincinnati, Ohio, where he again took up the subject of railroad legislation.

On September 7th he opened an Eastern speaking tour in Maine, where he was well received. Following this he made another tour of the middle Western States, including Illinois, Wisconsin, and Indiana. The speeches which he made on this tour were devoted chiefly to the Adamson eight-hour law, and the manner of its passage through Congress, and to severe criticisms of the Mexican policy of the administration. At Springfield, Ill., he criticized the Adamson law as follows:

"Manifestly we have here an extremely intricate question of rates and outlays. What was the manifest duty of the executive? Plainly to insist that investigation should precede action, and that nothing should be yielded to force. Not only did the administration fail to take proper action on its own initiative, but the business men of the country appealed in vain to the administration for investigation. Their request won no favorable action.

"I stand for the principle of arbitration in industrial disputes. Labor, least of all, can afford to have that principle surrendered. It is a civilized method, as opposed to the injurious contests of force, which impoverish labor and imperil the social order. The essence of the matter is a fair and reasonable hearing of all parties concerned and a just determination according to the facts. To say that fair and prompt arbitration could not have been had in this case is to indict both the administration and the American people.

"When force is proposed and arbitration is refused there is but one stand to take, and that is to appeal to the judgment of the country to vindicate the processes of reason. Had the Executive, when arbitration was declined, at once directed the entire force of public opinion, as he easily could, to the demand for the recognition of the principles of arbitration, I have no doubt he would have won, and the nation would have been his debtor.

"Had the Executive gone at once to Congress for immediate authority to secure prompt and thorough investigation of the strikers' grievances in advance of action, and had he thus made instant provision for an inquiry so entirely competent as to command the respect of the country, I am satisfied there could have been no strike. We are still ruled by public opinion, and no administration need fear results if it stands firmly for essential principles.

"Contrast the action of this administration with what Grover Cleveland in 1886 said with respect to labor legislation—'All legislation on the subject should be calmly and deliberately undertaken, with no purpose of satisfying unreasonable demands or gaining partisan advantage.'

"It is idle to excuse the action taken on the Adamson bill by a request for additional legislation with respect to the future. That legislation was not obtained. We are dealing with what was demanded and actually enacted.

"We have an unjustifiable attempt to use public sentiment with respect to another eight-hour workday in order to justify a bill which does not provide another eight-hour workday, but relates solely to an increase in wages. We have seen the choice of what seemed to be the easier way, which escaped the necessity of a determined stand for principles. We have seen what has appeared to be the consideration of immediate political expediency at the expense of public welfare."

Mr. Hughes's criticisms on the administration's course in Mexico may be summarized in the address which he delivered at Richmond, Ind.:

"I have only recently received this authentic information of the actual instructions that were given with respect to the Government of Mexico. John Lind was authorized by the Executive to state this proposition to a minister of another government, and this is the authorized instruction: 'Huerta will be put out if he does not get out; that it is the preference of the President that it should be accomplished by domestic means if possible, but if it cannot be done by domestic means other means adequate for the purpose will be resorted to.'

"There is no basis for that in the recognition of the sovereignty of our neighbors. There is no basis for that in a true and correct American policy. We departed from American policy and left our citizens to suffer from

the barbarities which resulted when all government was destroyed and anarchy was supreme in Mexico.

"We were promised in the platform of our opponents of four years ago that the constitutional rights of American citizens should protect them on our borders and go with them throughout the world and every American citizen holding or having property in any foreign country should have the full protection of the United States government both for himself and for his property.

"On the contrary, we have seen American rights abused. We have seen American lives lost, property destroyed and commerce interfered with. There was one clear duty for the American administration in connection with Mexico. That was the protection of American lives and American property; at all events, that was a clear and understandable duty leading to the straight path of administrative action without the shadow of turning. But instead of that there was meddling with Mexican affairs which Mexico could not understand and which cost us their friendship and respect.

"I do not speak of the question whether Huerta should or should not have been recognized. That is a matter which presents a false issue. If the administration had felt on the information it had that he had a stable government and could perform international duties then it could properly have recognized him.

"If, on the other hand, it was satisfied that he did not perform the international obligations of Mexico, then it was competent to refuse recognition. But the one thing which was not proper and which had no basis was to conduct a personal war on Huerta for his extermination from Mexican politics. Yet that was what was done.

"The great duty of protecting American lives and property was left unperformed while an unofficial spokesman was sent to Huerta to inform him not simply that he would not be recognized, but that he must eliminate himself from Mexican politics. He was told by this unofficial spokesman that he could not even be a candidate at a Mexican election.

"Yet the truth is that we did intermeddle with those affairs in a way which forfeited to us the esteem that we should have enjoyed, and finally resulted in leaving Mexico to the ravages of revolution, without protection of our citizens or the citizens of any other country. We left them to an anarchy which was indescribable and to atrocities which will not bear repetition in polite society.

"There is one way and one clear way to secure the respect of Mexico and of every other nation and to maintain our prestige and our influence; one way to be really helpful, and that is for America to recognize the just demands of American citizenship and protect American lives and property throughout the world, and I stand here to say that, so far as I am concerned, I shall to the utmost of my powers maintain American rights on land and sea throughout the world with respect to all nations, as to American lives, American property and American commerce."

In the Pennsylvania steel district on September 27th, Mr. Hughes emphasized a plea for a protective tariff, and announced on September 29th that he favored the eight-hour working day, providing a thorough investigation was made of its application before it was put into effect. At Buffalo, N. Y., on September 30th, he declared that the Democratic administration had blocked American trade abroad despite its professing to aid it, and cited, as examples, the opposition to the bankers' participation in the six-power loan to China and the administration's action in Mexico.

The election held in Maine on September 7th resulted in the success of the Republican ticket by a plurality which seemed to assure the reunion of the Progressive and Republican parties in that State. This result greatly cheered the Republican leaders, because the campaign up to this time had been devoid of any great enthusiasm. Mr. Hughes's speeches, while they were well received by most audiences, seemed to lack fire and vigor. A very general "slump" had characterized the Republican campaign. Prior to the passage of the Adamson law the chief issue urged by the Republican speakers, including Mr. Hughes, was the weakness of President Wilson's foreign policy toward Mexico and toward the warring countries in Eu-

rope. The passage of this measure, however, gave them a new issue of which they were not slow to take advantage, and for the rest of the campaign the most aggressive attacks upon Mr. Wilson were directed against the eight-hour law.

The much-heralded pro-German support of Mr. Hughes did not materialize. His frank criticism of the failure of President Wilson to insist on a strict observance of international law as regards Germany and other similar criticisms quickly alienated the support of the aggressive pro-German propagandists, so that little was heard from them during the campaign.

Colonel Roosevelt delivered his first speech in the campaign at Lewiston, Maine, on August 31st, and following that date he took an active part in it both by speaking and by writing. In his Lewiston speech he vigorously attacked President Wilson and the policies of his administration, assailing chiefly the Mexican policy, which he declared had produced "a bloody peace in Mexico." He also attacked the administration for its "safety-first policy," following the invasion of Belgium. He said:

"During the last two years we have seen an evil revival in this country of non-American and anti-American divisions along political-racial lines; and we owe this primarily to the fact that President Wilson has lacked the courage and vision to lead this nation in the path of high duty and by this lack of affirmative leadership has loosened the moral fibre of our people, has weakened our national spirit, and has encouraged the upgrowth within our own borders of separatism along the lines of racial origin."

On September 30th, Mr. Roosevelt made an aggressive attack on President Wilson's administration in an address delivered at Battle Creek, Mich. He concerned himself, as usual, with the President's Mexican and foreign policies. In this address, however, he added criticisms of the eight-hour law. In connection with Mexico, Mr. Roosevelt asserted that the President had shown inconsistency by refusing to recognize Huerta because of the manner in which he had attained power, and at the same time recognizing Colonel Benavides, in Peru, who, he claimed, had reached the presidency by the same means which Mr. Wilson denounced in the case of Huerta.

In relation to the eight-hour law, Mr. Roosevelt declared with great emphasis that it was not a question of hours of labor, but a question of wages. He also outlined what, in his opinion, the President should have done as follows:

"There was but one course that could rightly have been taken, and that the perfectly simple course. The President had ample knowledge. He had many weeks in which to secure proper action by the parties to the controversy; and if either would not agree to such action, he had ample time in which to get Congress to give him any power necessary in order to deal thoroughly and without difficulty with the situation. If the regular board of mediation and conciliation was inadequate, he should have at once appointed a special commission, which would have included men thoroughly acquainted with the situation from the wage earners' standpoint, possessed of an understanding sympathy with the wage earners, and incapable of being bullied or of being influenced in any improper manner. The President should have insisted that every matter be laid before this committee of arbitration, and nothing withheld. The commission would have dealt in thoroughgoing and satisfactory fashion with all the various questions involved—all of which are interrelated and interdependent. It would have dealt with the question of an eight-hour day, and with the complicated question of the amount of wages to be paid for that day and for overtime in the various positions. It

would also have dealt with the question as to whether this necessarily meant an increase of rates. As an incident to this it would have had to take up the question of securing just remuneration to the property holders; and therefore it would have had to deal with any questions of recent over-capitalization; for although I do not believe it would be wise to take up old cases of over-capitalization (where grave injustice to innocent people would be caused by any action) any recent instances of over-capitalization should be accepted as having been gone into after full notice and with full knowledge, and should be punished accordingly.

"Pending the decisions of the commission, it should have been made clear that the President would permit no interference with the traffic which is essential to the life of the commonwealth; that there should be no stoppage of the arteries of circulation in the body politic and social; and that rather than see such a stoppage the government would itself run the trains if necessary, until such time as the commission could report. When the commission's report was made, it would have become the duty of the government to see that it was put into effect, and in case of any controversy itself to interpret and apply the rules. That was the course demanded by courage and honor; and that was the course demanded by every man to whom Americanism was a fact, and not an empty phrase."

On October 8th, Mr. Hughes started on his third campaigning tour. Speaking in Philadelphia on that date, he declared that Republicans would not tolerate interference with American commerce or mail. In Baltimore, on the following day, he declared that he would not meddle in foreign affairs, when they did not concern him, but would insist on the rights of Americans everywhere. He declared that President Wilson had hurt business by failing to protect American enterprise in other lands, notably Mexico.

In a speech delivered at Louisville, on October 12th, Mr. Hughes made the most definite and significant statement that had come from him on the proper attitude of the United States toward Germany. Although he had previously criticized the policies adopted by Mr. Wilson toward the German situation, his criticism had been in general terms. He had failed to state what he himself would have done in similar circumstances. For example, in the speech delivered in Philadelphia on October 9th, he said: "I repeat what I said in my speech of acceptance that had this government left no doubt that when we said 'strict accountability' we meant precisely what we said, and that we should unhesitatingly vindicate that position, I am confident that there would have been no destruction of American lives by the sinking of the *Lusitania*."

During the course of the address in Louisville one of Mr. Hughes's auditors inquired what he would have done about the *Lusitania*. He replied promptly that he would at once have broken off diplomatic relations with Germany if the German government had disregarded the protest he would have made after the warning against sailing on the *Lusitania* first appeared in the papers. He continued: "I have said that I would have had the State Department equipped so as to command the respect of the world at the outset of the administration, and next, I would have so conducted affairs in Mexico as to show that our words meant peace and good-will, the protection at all events of the lives and property of American citizens; and next, when I said 'strict accountability' every nation would have known that that was meant, and further, when notice was published with respect to the action, I would have made it known in terms unequivocal and unmistakable that we should not tolerate a continuance of

friendly relations through the ordinary diplomatic channels if that action were taken, and the *Lusitania* would never have been sunk."

At Lincoln, Neb., on October 14th, Mr. Hughes repudiated the charge that "a vote for Hughes means a vote for war." He made five speeches in Nebraska on October 16th, and on the following night a series of speeches in Iowa. In Sioux City, Iowa, he was asked by one of his auditors whether if elected president he would repeal the Adamson law. He replied, "You cannot repeal the surrender or abdication of authority."

While Mr. Hughes was touring the Middle West in the middle of October, Colonel Roosevelt visited the Mexican border States, and made a number of aggressive speeches, chiefly on the Mexican situation. He attacked the administration as cowardly and declared that of all the foreigners resident in Mexico, Americans and Japanese were most frequently plundered and killed. He declared that the best policy to be followed in relation to Mexico would have been the one followed by the United States in Cuba, that is, the occupation of the country by an American army, and the regeneration of the country by American methods. In his speech at Phenix, Ariz., he compared the conditions of Mexico with those in the Balkans. Colonel Roosevelt was received with the greatest enthusiasm in the course of these addresses.

Mr. Roosevelt continued his tour and visited Denver, where, on October 24th, he made a remarkable speech, in which he belittled the importance and effectiveness of the legislation passed by the Sixty-fourth Congress. On October 26th, he denounced the disloyalty of "professional" German-Americans before a large audience in Chicago. Returning to New York, he spoke on October 28th in Brooklyn, where he denounced the President for saying that in future great wars America would be unable to stay neutral.

Following his tour in the Middle West, Mr. Hughes spoke in New York City on October 24th. He declared that he wanted the support of no man "to whom the interest of this nation is not supreme," and indignantly repudiated the charge made by Democratic speakers that he had entered into a secret deal to obtain the vote of the so-called "hyphen" element. He addressed 10,000 persons in Boston on October 26th, and on the following day made an address in Rochester, N. Y. On October 29th Mr. Hughes gave out a statement of the things that he would stand for as President. He declared that his aims were: to be the administrative head, not a political leader such as Wilson, to appoint an able cabinet, to safeguard capital and labor interests by a protective tariff, to keep a strict but just oversight over business, and encourage business expansion on sound lines at home and abroad, to adopt a firm foreign policy, and defend American rights. This statement was given out during the course of an address in Columbus, Ohio.

The last week of October Mr. Hughes spent in New England and New York. He spoke on October 26th before an audience of working men in Hartford, Conn. In Boston he promised his hearers he would appoint "the ablest cabinet the country can supply," if he should be elected. He said also that in his opinion the privilege of American citizenship included the right to



be protected in any part of the world, but the authority of the United States could not be withheld at the pleasure of the government, but must be maintained under all circumstances. In the two succeeding days he made speeches in Utica and Rochester. In the former city he declared that a vote for the national Republican ticket was a vote for peace, since peace could only be secured by upholding the self-respect and prestige of the nation. Following these addresses he went to the Middle West for a series of final speeches in Ohio and Indiana.

Mr. Hughes ended his active participation in the campaign at a final Republican rally in New York City. An audience of 15,000 persons greeted him in Madison Square Garden. Prior to the meeting a parade of 70,000 Republicans carrying torches had passed up Fifth Avenue. In his address Mr. Hughes defended the right of American citizens who differed with the President to criticize the foreign policy of the administration. He denied that he favored war, and insisted that the only danger of war came from the President's failure to stand firmly for American rights. He urged a return to the protective tariff on the ground that "where there is a difference of labor costs against us the products abroad seeking this market will be sold, either to the disadvantage of American products, or the wages of American labor will be reduced." He declared that it was of no avail to ask Americans to develop the resources of backward countries if they were to be denied the protection of the American flag to which their citizenship entitled them. Following this address Mr. Hughes spoke before many other audiences in the city. At a meeting in Union Square former President Taft also spoke.

In the last days of October Colonel Roosevelt made a remarkable tour of the far Western States. In an address in Denver on October 21st, he placed emphasis on certain domestic policies upon which the Progressive party laid great stress in 1912, but which had largely dropped out of sight. He charged President Wilson with having neither enforced nor modified the Sherman Anti-Trust law, which he declared was negative and hostile to the progress of trade and industry. He declared himself in favor of the Progressive remedy for the evils of big business: regulation rather than suppression. He also advocated a vigorous use of the Federal taxing power and control of interstate commerce to secure an adequate standard of living for working men and working women. He praised the spirit of cooperation and public interest in the welfare of the individual which had given Germany such strength, and warned his hearers that without industrial organization the United States could not compete with European countries of superior collective efficiency. In his speech in Chicago on October 26th he denounced the disloyalty of "professional" German-Americans. In a speech in Brooklyn on October 28th he scored President Wilson for saying that in future great wars America would not be able to remain neutral.

On November 2nd, Colonel Roosevelt spoke before a large audience in Cleveland, Ohio, laying special stress on the alleged failure of the Wilson administration to protect American lives on the high seas and in Mexico. His last speech was delivered at Cooper Union on No-

vember 4th. In this he denounced President Wilson "as another Buchanan," and urged his hearers to follow the example of the men of 1860, who exchanged Lincoln for Buchanan. He accused the President of having adroitly and cleverly and with sinister ability appealed to all that is weakest and most unworthy of the American character.

**THE PROGRESSIVE POST-CONVENTION CAMPAIGN.** It was stated in discussing the Progressive national convention that Colonel Roosevelt, when he refused conditionally to accept the presidential nomination, promised to write to the members of the national committee when he had decided whether he could accept Mr. Hughes as a candidate. Following the dinner with Mr. Hughes noted above, Colonel Roosevelt on June 20th sent to the national committee a letter which was in effect his farewell to the party for whose formation he had been responsible. He said: "Our loyalty is to the fact, to the principles, to the ideal, and not merely to the name, and least of all to the party name. . . . With all my heart I shall continue to work for these great ideals. . . . The people under existing conditions are not prepared to accept a new party." He counseled his fellow-Progressives in the face of this fact, as follows:

"It is impossible for us Progressives to abandon our convictions, but we are faced with the fact that as things actually are, the Progressive national organization no longer offers the means whereby we can make these convictions effective in our national life. Under such circumstances our duty is to do the best we can, and not to sulk because our leadership is rejected. That we ourselves continue to believe that the course we advocated was in the highest interest of the American people is aside from the question. It is unpatriotic to refuse to do the best possible because the people have not put us in a position to do what we regard as the very best. It remains for us good humoredly and with common sense to face the situation and to endeavor to get out of it the best that it can be made to yield from the standpoint of the interests of the nation as a whole."

Mr. Roosevelt declared that the best interests of the country demand "the alignment under the leadership of the forces opposed to the continuance in power of Mr. Wilson and the Democratic party." He asserted that the present administration had been guilty of shortcomings more signal than those of any administration since the days of Buchanan. He asserted indeed "that no administration in our history has done more to relax the spring of the national will and to deaden the national conscience." Such an alignment, he asserted, was possible under Mr. Hughes, whom he regarded as a man whose public record was a guarantee that he would not only stand for such a programme before election, but would "resolutely and in good faith put it through if elected." For this reason he would "strongly support Mr. Hughes."

Mr. Roosevelt then proceeded to arraign the Wilson administration and to praise warmly the Republican candidate. He said: "Mr. Hughes has shown in his career the instinct of efficiency which will guarantee that under him the government will once more work with vigor and force. He possesses that habit of straight-

forward thinking which means that his words will be correlated with his deeds and translated into facts. His past career is the warrant for our belief that he will be the unfaltering opponent of that system of invisible government which finds expression in the domination of the party boss and the party machine. His past career is a guarantee that whatever he says before election will be made good by his acts after election. Morally his public record shows him to be a man of unbending integrity; intellectually it shows him to be a man of honest and trained ability. We have the alternative of continuing in office an administration which has proved a lamentable failure or putting into office an administration which we have reason to believe will function with efficiency for the interest and honor of all the people. I hereby bespeak my Progressive friends their ungrudging support for Mr. Hughes."

This letter marked the practical elimination of the Progressive party as a factor in national politics, at least during this campaign. It was to a larger extent than ever before in the history of political parties a personal party, and its continuance as a party depended entirely upon Colonel Roosevelt. There was, however, little disposition on the part of Progressives to criticize him for his reentrance into the Republican party, for it was realized that he acted from the highest motives, and that his sole purpose was to bring about the success of Republican policies which he advocated, and the defeat of President Wilson and those policies to which he was so bitterly opposed.

On June 26th the national committee of the Progressive party placed the name of Charles E. Hughes at the head of their ticket, in place of Theodore Roosevelt. No other action was possible following the letter from Mr. Roosevelt declining to accept the nomination. The more radical members of the committee offered to substitute the name of Victor Murdock, of Kansas, in place of Mr. Roosevelt. This was lost by a vote of 31 to 15. The vote to endorse Mr. Hughes was 26 to 6. The majority of the Progressive leaders in all parts of the country agreed to this action of the national committee, and promised their warmest support to the candidacy of Mr. Hughes. A few local organizations refused to abide by the action of the committee, and the Democratic party at once set measures on foot to win their support for President Wilson. Mr. McCormick, chairman of the national committee, asserted that he was confident of "sufficient Progressive support to make the reelection of President Wilson certain."

There were attempts on the part of certain Progressive leaders following the action of the national committee to refuse to endorse the candidacy of Mr. Hughes. New Jersey, at the meeting of the State committee, rejected the candidate of the Republicans. The chief opposition, however, came from the Southern Progressives, a majority of whom were never in the Republican party. The leader of this opposing element was John M. Parker, of Louisiana, the Progressive nominee for vice-president. He issued a call for a new convention for August 5th, to nominate an independent ticket. In his statement he set forth the reasons why Progressives should repudiate the endorsement of Mr. Hughes. He said:

"Earnest, patriotic and able men from every State in the Union worked to bring about a radical change which would enable the West and particularly the South to handle their own problems, develop, as they would do, amazingly, and take a virile part in national life.

"I joined the Progressive party from a deep-seated conviction that it stood for what was best for humanity, best for my country, best for my State, and best for the people of the South. To-day my views are stronger than ever that I was absolutely right.

"I did not want office then, and I do not want office now, and my appeal to the men and women of America and of every individual State is to call another convention to meet in Chicago on August 5, the fourth anniversary of the Progressive party, to nominate candidates for President and Vice-President, and let me labor in the ranks and on the stump to prove my loyalty for the purpose I believe in, and not for office elective or appointive."

The convention of the radical leaders of the party was held on August 3rd at Indianapolis, where plans for the reorganization and perpetuation of the Progressive party as a national political organization were made. The convention decided against the reassembling of the party for a national convention to fill the vacancy on the national ticket caused by the action of Colonel Roosevelt in declining the nomination for President. It was decided instead to put up an electoral ticket, bearing the name of Mr. Parker for Vice-President in every State where an organization was left, in the hope of perhaps nominating enough presidential electors who might have the balance of power in the event of a close contest between the two parties. The endorsement of Mr. Hughes was severely criticized by the party leaders. In spite of this action, however, the party as a whole did not take an active place in any of the States as a political factor, and carried no electoral votes.

On October 14th, John M. Parker accepted the Progressive nomination for the office of Vice-President. In his address of acceptance he virtually admitted that owing to the action of the party leaders in endorsing the Republican ticket, his candidacy was little more than a farce. His speech was divided between a vitriolic attack upon Colonel Roosevelt, Mr. Perkins, and other Progressives who had become identified with the Republicans, and a eulogy upon the progressive administration of Mr. Wilson. He promised to make an aggressive campaign for the Democratic candidate.

In not more than half a dozen States in the Union did Progressive electors appear on the ballot independently of other party tickets, and practically every attempt of the anti-fusionist Progressives to obtain a full national ticket failed.

**DEMOCRATIC POST-CONVENTION CAMPAIGN.** Immediately after the notification that he had been nominated, President Wilson on June 15th, appointed Vance C. McCormick, once Democratic and Progressive candidate for Governor of Pennsylvania, chairman of the Democratic national committee, and preparations were at once begun by Mr. McCormick to carry on an aggressive campaign. Mr. Wilson himself decided to make no campaign tours, but to remain quietly in his summer home, "Shadow Lawn," Long Branch, N. J. There was little activity in the Democratic campaign until President Wilson had been formally notified of his re-nomination. This was done on September 2nd at Shadow Lawn.

The most striking portions of his speech of acceptance are given herewith:

"I do not doubt that the people of the United States will wish the Democratic party to continue in control of the government. . . .

"Alike in the domestic field and in the wide field of the commerce of the world, American business and life and industry have been set free to move as they never moved before.

"The tariff has been revised, not on the principle of repelling foreign trade, but upon the principle of encouraging it. . . . and a tariff board has been created whose function it will be to keep the relations of America with foreign business and industry under constant observation, for the guidance alike of our business men and of our Congress. American energies are now directed toward the markets of the world.

"The laws against trusts have been clarified by definition, with a view to making it plain that they were not directed against big business, but only against unfair business and the pretense of competition where there was none, and a trade commission has been created with powers of guidance and accommodation which have relieved business men of unfounded fears and set them upon the road of hopeful and confident enterprise.

"By the Federal Reserve Act the supply of currency at the disposal of active business has been rendered elastic. . . .

"Effective measures have been taken for the recreation of an American merchant marine and the revival of the American carrying trade. . . . For the farmers of the country we have virtually created commercial credit by means of the Federal Reserve Act and the Rural Credits Act. . . . By an intelligent warehouse act we have assisted to make the standard of crops available as never before both for systematic marketing and as a security for loans from the banks. . . . The workmen of America have been given a veritable emancipation by the legal recognition of a man's labor as part of his life and not a mere marketable commodity, by exempting labor organizations from processes of the courts which treated their members like fractional parts of mobs and not like accessible and responsible individuals, by releasing our seamen from involuntary servitude, by making adequate provision for compensation for industrial accidents, by providing suitable machinery for mediation and conciliation in industrial disputes and by putting the Federal Department of Labor at the disposal of the workman when in search of work.

"We have effected the emancipation of the children of the country by releasing them from hurtful labor. We have instituted a system of national aid in the building of highroads such as the country has been feeling after for a century. We have sought to equalize taxation by means of an equitable income tax. . . . We have provided for national defense upon a scale never before seriously proposed upon the responsibility of an entire political party. We have driven the tariff lobby from cover and obliged it to substitute solid argument for private influence.

"This extraordinary recital must sound like a platform, a list of sanguine promises, but it is not. It is a record of promises made four years ago and now actually redeemed in constructive legislation. . . .

"The rights of our own citizens became involved; that was inevitable. Where they did, this was our guiding principle—that property rights can be vindicated by claims for damages when the war is over, and no modern nation can decline to arbitrate such claims, but the fundamental rights of humanity cannot be. The loss of life is irreparable. Neither can direct violations of a nation's sovereignty await vindication in suits for damages. . . .

"The passions and intrigues of certain active groups and combinations of men among us who were born under foreign flags injected the poison of disloyalty into our own most critical affairs, laid violent hands upon many of our industries and subjected us to the shame of divisions of sentiment and purpose in which America was forgotten. It is part of the business of this year of reckoning and settlement to speak plainly and act with unmistakable purpose in rebuke of these things, in order that they may be forever hereafter impossible. I am the candidate of a party, but I am above all things else an American citizen. I neither seek the favor nor fear the displeasure of that small alien element among us which puts loyalty to any foreign power before loyalty to the United States. . . .

"The Mexican people are entitled to attempt their liberty. . . . and so long as I have anything to do with the action of our great government I shall do everything in my power to prevent any one standing in their way. . . . The unspeakable Huerta betrayed the very comrades he served, traitorously overthrew the government of which he was a trusted part, impudently spoke for the very forces that had driven his people to the rebellion with which he had pretended to sympathize. The men who overcame him and drove him out represent at least the fierce passion of reconstruction which lies at the very heart of liberty, and so long as they represent,

however imperfectly, such a struggle for deliverance I am ready to serve their ends when I can. . . . Mistakes I have no doubt made in this perplexing business, but not in purpose. . . .

"There must be a just and settled peace, and we here in America must contribute the full force of our enthusiasm and of our authority as a nation to the organization of that peace upon world-wide foundations that cannot easily be shaken. No nation should be forced to take sides in any quarrel in which its own honor and integrity and the fortunes of its own people are not involved, but no nation can any longer remain neutral as against any willful disturbance of the peace of the world. . . .

"The nations of the world must unite in joint guarantees that whatever is done to disturb the whole world's life must first be tested in the court of the whole world's opinion before it is attempted. . . .

"Besides contributing our ungrudging moral and practical support to the establishment of peace throughout the world, we must actively and intelligently prepare ourselves to do our full service in the trade and industry which are to sustain and develop the life of the nations in the days to come.

"We have already been provident in this great matter and supplied ourselves with the instrumentalities of prompt adjustment. . . . It will only remain for the masters of enterprise among us to act in energetic concert and for the Government of the United States to insist upon the maintenance throughout the world of those conditions of fairness and of even-handed justice in the commercial dealings of the nations with one another upon which, after all, in the last analysis, the peace and ordered life of the world must ultimately depend. . . .

"We believe that the day of little Americanism, with its narrow horizons, when methods of 'protection' and industrial nursing were the chief study of our provincial statesmen, are gone and that a day of enterprise has at last dawned for the United States, whose field is the wide world.

"We hope to see the stimulus of that new day draw all America, the republics of both continents, on to a new life and energy and initiative in the great affairs of peace. We are Americans for big America and rejoice to look forward to the days in which America shall strive to stir the world without irritating it or drawing it on to new antagonisms. . . . and when all mankind shall look upon our great people with a new sentiment of admiration, friendly rivalry and real affection as upon a people. . . . to whom humanity is dearer than profit or selfish power."

The first speech of his campaign for reelection, made on September 23rd, President Wilson devoted to a defense of the Adamson law, which he strongly justified. He said: "You know that we have been a legalistic people. I say with due respect to some men for whom I have a high esteem that we have been too much under the guidance of the lawyers, and the lawyer has always regarded the relations between the employer and the employee as merely a contractual relationship, whereas it is, while based upon a contract, very much more than contractual relationship. It is a relationship between one set of men and another set of men with hearts under their jackets, and with interests that they ought to serve in common, and with persons whom they love and must support on one side and on the other. Labor is not a commodity, it is a form of coöperation, and if I can make a man believe in me, know that I am just, know that I want to share the profits of success with him, I get ten times as much out of him as if he thought I was his antagonist, and his labor is cheap at any price. That is the human side of it, and the human side extends to this conception. That laboring man is a partner of his employer. If he is a mere tool of his employer he is only serviceable as a tool. His enthusiasm does not go into it. He does not plan how his work shall be done. He does not work upon the business or enterprise as a whole, and wish to coöperate to the success of it as a whole. Human relationships, my fel-

low citizens, are governed by the heart. and if the heart is not in it, nothing is in it."

Making application of this conception of the relationship between the employer and the employee Mr. Wilson declared that when the controversy between the railroad employees and their employers engaged his attention he perceived at once that the principle of the eight-hour day is not arbitrable. He said: "We believe in the eight-hour day because a man does better work within eight hours than he does within an extended day, and that the whole theory of it, a theory which is sustained now by abundant experience, is that his efficiency is increased, his spirit in his work is improved, and the whole moral and physical vigor of the man is added to. This is no longer conjectural; where it has been tried it has been demonstrated. The judgment of society, the vote of every legislature in America that has voted upon it, is a verdict in favor of the eight-hour law." In reply to the railroad executives' assertion that the establishment of the eight-hour law would cost the roads an immense sum of money, he replied: "How do you know how much it would cost you?" and declared that the reasonable thing to do was to create the eight-hour law not because the men demanded it, but because it was right. He promised that if he could obtain authority from Congress he would appoint a commission to observe the results and report upon them, in order that justice might be done to railroads in respect to the cost of the experiment. Summing up the entire matter he said: "This thing ought to have been done, and it had to be done at the time that it was done, so as to bring about the reasonable trial of the eight-hour day, and a careful examination of the results of the eight-hour day."

On September 30th, President Wilson delivered an address before members of the Young Men's League of Democratic Clubs, who visited his home at Shadow Lawn. The speech was received with great enthusiasm. The President attacked the Republican party severely. He reminded his hearers that the Democratic party was the only party in the United States which had survived from the beginning of the government. He made the prediction that the Republican party would meet the fate of the Federalist and Whig parties. His faith in the permanence of the Democratic party and his conviction that the Republican party would pass away were founded on the fact that the Democratic party "is the only party all of whose life has been governed or at any rate inspired by definite principles, an absolute belief in the control of the people, their right to control, their capacity to control their own affairs, and shape them in the common interest." He declared that the Republican party as now composed and led believed in a government by the attorneys of special interests. He paid a warm tribute to the Progressive party, and declared that the Democratic party would do the things which the Progressive party had wanted to do, and could not do because they had not the power. He made the assertion that the Republican party wished merely to get control of the government, and that it consequently had no real principles. He declared that that party would make radical changes in the foreign policies of the United States, if it came into power, and asked

"if they are going to change it in what direction are they going to change it?" This question he answered as follows:

"There is only one choice as against peace, and that is war. Some of the supporters of that party, a very great body of the supporters of that party, outspokenly declare that they want war, so that the certain prospect of the success of the Republican party is that we shall be drawn in one form or other into the embroilments of the European war."

The President further asserted, commenting upon the Federal Reserve act, that in the days of Republican rule the administration of the Treasury of the United States was controlled by Wall Street. He asserted that the Republican leaders and the special interests behind them would be perfectly content with much of the important legislation passed by the Democratic party, including the Federal Reserve act, the tariff board law, and the rural credits law, if they could have the opportunities of the members of the boards created by those acts. In conclusion he said:

"But now you will notice we have returned to the good old days of Mark Hanna in the Republican party. Some of the very gentlemen who were prominent in that odious régime are now at the head of affairs in the management of the Republican campaign. The lieutenants of Mark Hanna have returned to authority, and the lieutenants of Mark Hanna represent the choices, the determinations, and, so much as we can conjecture, the policy of the Republican party. What they want to do is to get control and then determine the policy in private conference. We are not going to be taken into their confidence.

"It would not be wise for them to take us into their confidence. They want to control, possess. Those are the magic words for them. They do not think we have sense enough. They do not think we have coherence enough. They do not think a great body of free people know how to hang together in its own cause, and that a little body of men that always hangs together can in the long run manage the people, and it is up to us to show them that that is impossible. The people of the United States have frequently been fooled, but they are not often fooled several times in the same way, and this barefaced attempt to fool them in the same old way is, in my judgment, one of the most futile things that was ever attempted."

In the first week in October President Wilson made a trip to Omaha, where, on October 5th, he made an address.

In this he replied indirectly to the criticisms of his foreign policy made by Colonel Roosevelt and Mr. Root. He denied that he thought that America should refuse to take an active part in the affairs of Europe, but declared that at the present time he could not see the justification for any intervention in the present conflict. He said in part: "It will take the long inquiry of history to explain this war, but Europe ought not to misunderstand us. We are holding off, not because we do not feel concerned, but because when we exert the force of this nation we want to know what we are exerting it for.

"Nothing that concerns humanity, nothing that concerns the essential rights of mankind, can be foreign or indifferent to us, but in fight-

ting for these things, my fellow countrymen, we want to have a touchstone. We want to have a test. We want to know whenever we act what the purpose is—what the ultimate goal is.

"We want all the world to know that we are ready to lend our force without stint to the preservation of peace in the interests of mankind. What disturbs the light of the whole world is the concern of the whole world, and it is our duty to lend the full force of this nation, moral and physical, to the league of the nations which shall see to it that nobody disturbs without submitting his case first to the opinion of mankind."

Mr. Wilson made addresses also in Indianapolis on October 12th and in Chicago in October 19th. Returning to Shadow Lawn on October 21st he addressed several thousand Pennsylvanians. In this speech he repeated the accusation that the Republican party was still controlled by the reactionary Old Guard, both in the nation and in the State of Pennsylvania. He declared that the new constitution for New York was defeated in 1916 because the voters distrusted the Republican party, who had made it. He made a strong plea for a league of the nations, which would confront an offending nation with the combined power of the rest of the world. He also urged the voters to elect a Democratic congress, as the only way in which his administration could be made effective. In relation to the Sixty-fourth Congress he said: "There is something quite as important as the choice of the chief magistrate. I want you to remember that the real source of action and the real machinery of obstruction are in Congress, not in the presidency. Do you suppose that anything could have been accomplished in the last three and one-half years had there not been a determined and willing majority in the Congress?"

"I have not led these gentlemen; I have gone forward with them. I call your attention to the fact that there is nowhere recorded a single Wilson policy. Everything that I have asked Congress to do was written in the pledges of the party itself. And the only power I have exercised is the power of coöperation, the power that all men exercise when insisting upon the obvious duties of a great hour, when men take heart to do a great thing."

President Wilson, in forcing through Congress the Adamson law, won for himself the support of organized labor in so far as it was represented by its great organizations, and in the middle of October the American Federation of Labor through its labor representation committee issued a public statement to officers of organized labor, strongly favoring President Wilson and a Democratic Congress. The statement read in part as follows:

"Never at any time within the last fifty years have the workers had more at stake in any political campaign than in the one that is to be decided in the election on November 7.

"During the present administration and particularly in this campaign, there has been developed a clear-cut issue between the workers—the producers—and those who manipulate the products of the labor of others—the exploiters.

"During the present administration the organized labor movement has been able to secure recognition for the rights of human beings and opportunity for all to participate in the affairs of the nation in a degree that has never before been accomplished.

"The dignity of human life and the value of the

coöperation of those whose work is necessary to the processes of industry and commerce have been given an important place in considering all problems that concern the nation. This recognition has taken the form of legislation necessary to protect the interests of wage earners and in the ideals that have guided and directed national policies both at home and in our relations with other nations. . . .

"The interests that have been seeking to plunge our country into war not only with European countries but also with Mexico are the interests that are represented by the most selfish and most conscienceless element of Wall Street. These elements have not stopped with an effort to use existing mistakes and wrongs as an excuse for war, and have not hesitated to endeavor to create situations that brought the nation to the very brink of war. It was only by the determined resistance of the citizens who understood that an element of reasonableness was injected into the situation and action prevented until the true facts could be discovered and the will of the masses of the citizens could prevent the evil purposes and designs.

"The American seamen, the last group of workers who could under the law be compelled to perform compulsory service, have been made free men and given the right to quit their ships when in safe harbors. . . ."

Due to the initiative of President Wilson, the Congress extended the United States eight-hour law to include the workmen engaged in the operation of the railroad train service of the country, and a great national strike was averted.

President Wilson again made a speech in the Middle West on October 26th, where in Cincinnati he made a declaration that "this is the last war that involves the world that the United States can keep out of." He gave it as his belief that "the business of neutrality is over" and that "war has now reached such a scale that the position of neutrals sooner or later becomes intolerable."

The last days of his campaign for reelection Mr. Wilson devoted to New York and New Jersey. A Democratic rally was held in Madison Square Garden on November 2nd. Here President Wilson expressed confidence in his reelection and reviewed the conduct of the campaign. He declared that the Republicans in their struggle to get control of the country had dangerously aggravated class divisions, and the prejudices of different national elements of the American people. He defended the eight-hour law, and other measures passed during his administration. The President made several other addresses in New York City. His final address was delivered at Shadow Lawn on November 4th. A portion of this address was devoted to the local campaign in New Jersey. He charged the Republican candidate for governor with being a servant of "invisible government." Turning to national issues, he declared that the tariff was no protection to labor, since high wages were often paid in unprotected industries, and evil conditions prevailed in many industries that had received the benefits of high tariff. He denounced Republican business men for attempting to coerce a Democratic employee, and declared that the small and selfish group of capitalists, who formerly controlled the credit of the country, "now control nothing but the betting."

Surrounded by his family and a few intimate friends, Mr. Wilson awaited the result of the election at Shadow Lawn.

#### IV. THE RESULTS OF THE ELECTION

President Wilson was reelected by the narrowest margin of electoral votes that had determined an election since the Hayes-Tilden campaign of 1876. So close was the result in

several of the States that over a week elapsed before it was finally conceded that he had been elected. On the evening of November 7th, reports came in from all over the country showing that Mr. Hughes had carried what were conceded by both parties to be doubtful States, including New York, Illinois, Indiana, and others. At this time it was generally conceded that Mr. Hughes had been elected, and only the chairman of the Democratic National Committee, Vance McCormick, insisted that later returns would show the reelection of President Wilson. Returns coming in from States hitherto not heard from revealed on November 8th the accuracy of this forecast. The result hinged upon the count of votes in California and Minnesota, which had been regarded as Republican. In the former State, where an enormous vote had been cast on account of the participation of women in the election, returns showed that President Wilson had a lead of about 2000 votes, with a large number of precincts in Los Angeles still to be accounted for. In Minnesota Mr. Hughes had a lead of several hundred votes, and in New Hampshire and North Dakota the votes were so evenly divided that no one could foretell the final result until the last ballot had been accounted for.

The early election returns came largely from the States east of the Mississippi and showed unexpected Republican strength, especially in Illinois and New York. In addition to the States mentioned above, West Virginia and New Mexico were also doubtful, but eventually West Virginia and New Mexico were placed in the Republican column, and the other doubtful States in the Democratic column. The final results from California which decided the election gave the highest Democratic elector 466,289 votes, and the highest Republican elector 462,516 votes. This gave 13 electoral votes to President Wilson, and finally assured his reelection. In Minnesota Hughes received 179,544 votes, and Wilson 179,152, giving the 12 electoral votes of the State to Hughes. In New Hampshire Wilson received 43,779 votes, and Hughes 43,723. As will be noted from the table on page 745, President Wilson received 276 electoral votes, and Mr. Hughes 255. The popular vote cast for President Wilson was 9,116,296, and for Mr. Hughes 8,547,474. Thus President Wilson received 568,822 more votes than Mr. Hughes. It was the largest vote ever cast in the history of American politics. Aside from the natural increase in the vote in the four years from 1912, the fact that women voted in several of the States swelled the total. The total popular vote in 1912 was 15,045,294, while the popular vote cast for Wilson and Hughes in 1916 was 17,663,770.

A notable feature of the election was the falling off in the Socialist vote, which in 1912 amounted to 901,000. This fell in 1916 to 750,000. The vote for Hanly, the Prohibition candidate, was 225,101, compared with 207,928 for Chafin in 1912. The total increase in the popular vote was 3,593,549, which is to be accounted for by the increase in the population and the woman suffrage vote in the new suffrage States.

The result in Congress of the election was to increase considerably in both houses the Republican membership. In the Sixty-fifth Congress, the House of Representatives is composed of 217 Republicans, 212 Democrats, and 6 mem-

bers of other parties; thus the practical control of the House will be in the hands of members of Socialist and independent parties. In the Senate the Democrats retained their majority, which was cut from 14 to 12. Republicans succeeded Democrats in California, Maryland, New Jersey, New York, and West Virginia, and Democrats succeeded Republicans in Delaware, New Mexico, Rhode Island, Utah, and Wyoming. One of the new members elected to the Senate was Governor Hiram Johnson of California. In Indiana two Republican Senators were elected, defeating two Democrats who were candidates for reelection. For the first time in the history of the country a woman was elected to the House of Representatives. This was Miss Jeannette Rankin (q.v.), who was elected on the Republican ticket in Montana. (See MONTANA.) Woman suffrage was voted upon by the electorates of West Virginia and of South Dakota. (See *Politics and Government* under these States). Prohibition made important gains at the polls. Michigan, Montana, South Dakota, and Nebraska voted for prohibition, while Utah and Florida are expected to enact a prohibition law at the next session of the Legislature.

The table on page 745 shows the pluralities in the presidential elections of 1912 and 1916, indicating the vote cast for the three main parties in 1912, and the two parties in 1916. The figures were compiled by the Associated Press.

**ELECTORAL COLLEGE.** While the election was in doubt, and while it seemed that the successful candidate might have a majority of the electoral vote, and the minority of the popular vote which had happened only a few times in the history of political campaigns, there was considerable agitation for the abolition of the electoral college. Newspapers so differing in their policies as the *New York Sun* and the *New York World* both urged that this feature of the elections should be done away with as having outgrown its original purpose. There was introduced into the Senate by Senator Shafroth of Colorado a resolution proposing an amendment to the Constitution providing for the election of President and Vice-President without the intervention of the electoral college. Senator Shafroth in introducing the resolution gave the following reasons why the electoral college should be abolished:

"The electoral college at the time of the formation of our government was deemed a wise means of electing the President and Vice-President, as it was anticipated the members would exercise their best judgment in selecting such officers. Washington hoped that political parties would never come into existence. However, they soon developed and after they had made nominations for those offices, presidential electors exercised no judgment of their own as to the candidates, but with only one exception cast their votes for the party nominees. The purpose of the electoral college having thus been voided, the machinery by which the electoral vote was cast became not only cumbersome, but dangerous. Notwithstanding full explanations having repeatedly been made many voters when they go to the polls expect to vote directly for President and Vice-President, and consequently the list on the ballots of different groups of men as electors for such officers is confusing to them. The re-

Y. B.	1916			1912				
	Electoral Vote		Total Vote	Plurality		Total Vote	Plurality	
	Wilson, Dem.	Hughes, Rep.	Wilson, Dem.	Hughes, Rep.	Wilson, Dem.	Roosevelt, Prog.	Wilson, Dem.	Roosevelt, Prog.
16	12	97,778	69,116	28,662	82,488	22,689	59,750	174
17	9	83,170	20,524	12,646	10,324	6,949	3,875	174
18	8	112,186	49,827	62,859	68,888	24,467	44,541	174
19	13	466,289	462,616	3,778	283,486	8,914	283,610	174
20	6	178,816	102,808	76,508	114,232	58,886	41,926	174
21	7	99,786	106,514	6,728	74,561	68,334	84,129	174
22	8	24,521	28,794	1,278	23,681	15,987	6,688	174
23	6	56,108	14,611	41,497	86,417	4,279	81,882	174
24	14	125,881	11,225	114,606	88,076	21,980	71,096	174
25	4	70,021	56,868	18,668	88,921	5,191	81,882	174
26	29	950,081	1,182,816	202,285	404,980	82,810	25,527	174
27	15	324,083	341,005	16,942	283,890	253,446	18,597	174
28	18	221,699	280,449	58,750	151,267	162,007	119,883	174
29	10	514,868	277,656	86,932	183,628	179,808	23,506	174
30	18	269,900	241,854	28,046	193,584	174,845	120,210	174
31	10	79,875	6,644	78,251	239,584	116,512	102,766	174
32	6	64,118	69,506	5,388	60,966	3,894	57,072	174
33	8	188,859	17,847	21,012	51,118	26,546	24,618	174
34	18	247,885	268,822	20,927	174,315	54,956	57,789	174
35	15	286,775	899,097	52,822	150,751	156,129	142,875	174
36	12	179,152	179,544	392	106,426	152,244	214,584	174
37	10	80,888	4,258	76,130	57,227	1,595	8,645	174
38	18	898,082	869,889	28,698	880,746	207,821	124,871	174
39	4	101,063	66,750	84,813	27,941	18,512	22,456	174
40	8	158,827	117,771	41,056	109,008	54,216	72,689	174
41	3	17,776	12,127	5,649	7,986	3,196	2,866	174
42	4	48,779	48,728	56	84,724	82,927	17,794	174
43	14	211,018	268,982	57,964	176,559	89,045	145,674	174
44	3	83,553	81,161	2,392	20,487	8,847	2,704	174
45	45	756,880	875,510	47,498	655,475	455,430	890,031	174
46	12	168,888	120,890	47,498	144,545	29,272	70,144	174
47	5	55,271	52,651	2,620	29,555	23,080	25,728	174
48	24	604,946	514,836	423,152	423,152	277,086	146,088	174
49	10	148,128	97,288	50,890	119,156	90,798	28,870	174
50	5	120,087	156,818	6,726	147,064	37,600	9,464	174
51	88	521,784	708,784	181,950	895,619	275,505	447,426	174
52	5	40,394	44,858	4,464	30,412	27,708	2,489	174
53	9	61,840	1,809	60,087	48,856	586	1,298	174
54	5	59,191	64,261	5,070	48,962	58,811	9,849	174
55	12	252,384	110,114	87,220	185,425	60,674	74,751	174
56	20	266,909	630,949	220,960	219,489	28,580	26,745	174
57	4	84,025	54,188	29,892	86,879	42,100	24,174	174
58	4	22,708	40,350	17,542	15,354	22,182	1,200	174
59	12	102,824	49,359	58,495	90,382	33,288	21,777	174
60	7	183,888	187,244	16,144	86,840	70,445	67,044	174
61	8	140,408	148,124	113,046	113,046	56,667	84,069	174
62	18	198,042	221,828	28,281	164,288	180,695	38,588	174
63	8	28,816	21,698	6,618	15,810	14,560	9,282	174
Total	276	9,116,296	8,547,474	568,822	6,297,099	3,486,899	4,124,959	2,172,140
			Wilson's plurality,	568,822	Wilson over Roosevelt,	2,172,140	All others comb'd over Wilson,	2,451,124

sult is that some presidential electors receive more votes than their party associates, and the effect sometimes is to split the vote of the State in the electoral college. Four years ago the vote of California was so divided, as was also the vote of West Virginia in the recent election. Since the election of 1872, 11 other States have split their vote under this system. Such results are subversive of the true intent of the voters of those States. . . . The constitutional amendment proposed provides that the candidates for President and Vice-President shall be directly voted for by the qualified citizens of each State, and that whoever receives the highest number of votes in the State for such offices shall be entitled to the electoral vote of such a State; his electoral vote shall be equal to one vote for each Senator and representative of that State, as now provided by the Constitution. In other words the electoral representation is preserved but the dangerous machinery abolished.

"Some believe that the President should be elected by a majority of the total vote of the republic, but a moment's reflection will show the impracticability of such a procedure. Colorado has woman suffrage, Connecticut has not. Although those States have practically equal population, the vote of Colorado is twice as large as that of Connecticut. Connecticut would never agree that the large vote of Colorado should be counted as part of the total vote of the republic when her vote is only half as large. Hence it would be impossible for such an amendment to receive the approval of the legislatures of three-fourths of the States."

No action was taken on this resolution, and with the final result of the election indicating a popular plurality as well as an electoral majority for Mr. Wilson the movement for the abolishment of the electoral college subsided.

**CAMPAIGN EXPENSES.** The expenditures made by the Democratic national committee amounted to \$1,808,348, and disbursements to \$1,684,589. Of the total received, \$465,558 was in contributions of less than \$100. The largest individual contributors to the Democratic fund were Cleveland H. Dodge of New York, \$79,000, and Edward L. Dohaney of California, \$25,000. Other individuals gave from \$3000 to \$12,500 each.

The Republican national committee received \$2,455,421, and expended \$2,441,565. The total came from 34,205 contributors. The largest individual contribution was from Harry Payne Whitney, \$30,000. Several others gave \$25,000, and large numbers gave from \$5000 to \$10,000 each.

**UNITED STATES AND THE WAR. THE QUESTION OF ARMED BELLIGERENT MERCHANTMEN.** The most pressing question awaiting solution at the beginning of 1916 related to the rights of merchant vessels to carry guns for defense. This question had already been before the American government at the beginning of the war when, in a memorandum, Germany was notified that in the view of the United States government "a merchant vessel of belligerent nationality may carry armament and ammunition for the sole purpose of defense without acquiring the character of a ship of war." This memorandum was sent to Germany as an answer to the German protest against the refusal of the United States to intern as ships of war British liners leaving or entering New York

with guns mounted. The German government dissented from the view that any belligerent merchant ship could carry guns. The United States declined to modify its rulings, but informed Germany that recognizing "the desirability of avoiding a ground of complaint," it had disapproved of the use of American ports by British vessels if armed, and had made representations to Great Britain that no armed merchant vessel since December, 1914, with the exception of two, had entered an American port.

The issue came strongly to the front at the beginning of 1916 from the sinking in the Mediterranean of a British ship, the *Persia*, which had carried a gun. This event took place on Dec. 29, 1915, and among the victims was the American consul at Aden, Robert McNeely. This event in itself did not raise the issue because Germany, Austria-Hungary, and Turkey all denied that the liner had been sunk by any of their submarines. The sinking of the ship, however, gave a new element to the submarine controversy, and an impression became current in Germany that the American government contemplated a change of policy on the submarine issue. The impression was strengthened by a proposal made by Secretary Lansing to the Allied Powers suggesting the disarmament of merchant vessels to assure the safety of their passengers and crew if attacked. This proposal was not well received by the Allied Powers, and nothing came of it. The announcement by Germany that all merchant vessels armed would be sunk without warning brought the issue squarely before the American government, and on Feb. 18, 1916, a resolution came before the Senate proposing acquiescence by the United States in the notification of the Central Powers of the right of their submarines to sink armed merchantmen. The foreign policy of President Wilson was bitterly assailed by Republican senators. There was a division in the Senate as to the stand the United States should take and a still wider one in the House of Representatives where a feeling prevailed that the country was slowly but surely headed toward war with Germany. A minority of the Congressmen made a demand that the American government warn all citizens off armed merchantmen and a resolution was actually pending in the House forbidding Americans to travel on ships that were armed. Finally President Wilson in a letter to Senator Stone on Feb. 24, 1916, refused to assent to any such abridgment of the rights of American citizens. This announcement of the President's had the effect of allaying somewhat the feeling in the House of Representatives, and efforts were made to smother the resolutions pending in both the House and Senate forbidding Americans to travel on armed merchant ships. In the belief that the country was with him in his stand, the President decided that an impression ought not to prevail that there was a division of feeling in the government, and that the question should be determined as to whether or not Congress upheld him. On Feb. 29, 1916, he demanded a test on the resolutions pending. In a letter addressed to the chairman of the House rules committee, President Wilson said:

"The report that there are divided counsels in Congress in regard to the foreign policy of the government is being made industriously use of in foreign capitals. I believe that report to



be false, but as long as it is anywhere credited, it cannot fail to do the greatest harm and expose the country to the most serious risks. I, therefore, feel justified in asking that your committee will permit me to urge an early vote on the resolutions on armed merchantmen which have recently been so much talked about in order that there may be afforded an opportunity for full public discussion and action upon them, and that all doubts and conjectures may be swept away, and our foreign relations once more cleared of damaging misunderstandings."

The House resolution, which had been proposed by McLemore of Texas, was thereupon revived for immediate consideration. The President's demand for a vote upon it came on the eve of the date set by the Teutonic powers for inaugurating their submarine war on armed merchantmen, March 1, 1916.

The immediate effect of the President's demand for a vote was to clear the air regarding the strength of his supporters in Congress. Opposition, however, was not entirely quelled. Senator Gore of Oklahoma introduced in the Senate a resolution forbidding Americans to travel on armed ships. He declared that he had been informed that if the American government insisted on maintaining its attitude in regard to armed merchantmen war would certainly result, and attributed to the President a statement to this effect. President Wilson denied that he had uttered words to which such a meaning could be attached. After two days' debate the resolution was finally put to a vote, and was defeated on March 3, 1916, by a vote of 63 to 14. Before the voting, however, the resolution had been so modified as to change its meaning. In its final form it read as follows:

"Resolved by the Senate, that the sinking by any submarine without notice or warning of an armed merchant vessel of her public enemy resulting in the death of a citizen of the United States would constitute a just and sufficient cause for war between the United States and the German Empire."

This resolution so beclouded the issue in the Senate as to make it doubtful what the question at issue was. Senator Gore himself voted against his amended proposal. The defeat of the resolution technically put the Senate on record against declaring war on Germany, if any of her submarines sunk an armed merchantman without warning. Actually the defeat of the resolution supported the administration in its policy of upholding the rights of Americans to travel on belligerent ships, and the small number of senators who voted for the amended resolution were hostile to the administration's policy.

In the meantime in the House the vote on the McLemore resolution had been delayed, and after an effort to have it laid on the table without further action it was defeated on March 7th by a vote of 276 to 133.

Following this action of Congress, Secretary Lansing issued a ruling of the State Department, defining the status of armed merchant ships. Germany was notified that the United States recognized the equity of her argument—that if a vessel was armed and used its armament to attack a submarine the latter could not be called upon to give warning—since by its so doing the safety of the submarine and its crew

was imperiled. He repeated, however, that it had been frequently pointed out that each case must be judged by itself, and that only a belligerent ship which had been proven guilty of such an offense could be regarded as a warship. The presence of armament could not of itself be construed as a presumption of hostility. The question thus remained practically as it had been prior to the passage of the resolutions in Congress.

The question came to a sharp issue, however, through the sinking by German submarines of four ships having Americans on board. These were the *Eagle Point*, the *Manchester Engineer*, the *Englishman*, and the *Sussex*. All were sunk except the last named vessel, and the Americans were saved except on the *Englishman*, though not in several cases without injury.

**CASE OF THE SUSSEX.** The circumstances of the torpedoing of the *Sussex* provoked a final clash between the United States and Germany. This vessel was a Channel ferryboat plying between Folkstone and Dieppe. On March 24, 1916, while nearing the latter port with 436 persons on board, including 75 Americans, she was struck by a torpedo from a submarine. The disabled boat was towed to Boulogne, where a majority of the persons were landed. About 50 persons lost their lives, and 3 Americans were hurt.

The American State Department at once instructed the American ambassador at Berlin to ascertain whether the *Sussex* had been attacked by a German submarine. Unofficial denials that this was the case came from Berlin, and the German admiralty declined to deny or explain until reports had been received from all submarines operating off the French coast. The State Department made no effort to discuss the case with the German government, but placed the burden of proof upon Germany. The first informal explanation from the German government was that the *Sussex* had struck a British mine, but this was quickly disproved. For 11 days after the attack on the *Sussex* the Berlin authorities preserved a spirit of ignorance regarding the torpedoing, but the seriousness with which the case was viewed in the United States, coupled with the instructions from Washington to Ambassador Gerard, at length caused the German office to call upon the admiralty for a report on the destruction of the vessel or if any submarine commander could throw any light upon it. On April 10, 1916, the German government informed the State Department that the admiralty had subjected the affair to the fullest investigation, and that it had found that no German submarine attacked the *Sussex*, but that one torpedoed another vessel in the same place, and with the same result. A sketch of the vessel attacked made by the commander of the submarine was submitted to show that it was not the *Sussex*. The charge was again made that the vessel had been blown up by an English mine. The note concluded as follows:

"Should the American government have at its disposal further material for a conclusion upon the case of the *Sussex* the German government would ask that it be communicated in order to subject the material also to an investigation. In the event that difference of opinion should develop between the two governments the German government now declares itself ready to have the facts of the case estab-

lished through mixed commissions of investigation in accordance with the third title of the Hague agreement for the peace settlement of international conflicts, Nov. 18, 1907." In explaining the sinking of the other three vessels the German note professed to be unable to say whether the *Manchester Engineer* was attacked by a German submarine, but declared that in the case of the *Englishman* and the *Eagle Point* the vessels were attacked while attempting to escape.

This communication created the worst of impressions in the United States. The explanation of the German government was considered to be very unsatisfactory, and the fact that a vessel resembling in general the *Sussex* had been torpedoed at the same time and place, was taken as conclusive evidence that a German submarine had made the attack. On April 19, 1916, President Wilson addressed Congress on the issue. He declared that a situation had arisen which made it his plain duty to speak with the utmost frankness. He announced that he had notified Germany that "unless the Imperial Government should now immediately declare and effect an abandonment of its present methods of submarine warfare against passengers and freight-carrying vessels the Government of the United States can have no choice but to sever diplomatic relations with the German government altogether." The address of the President was more or less a paraphrase of the note which had been on the same day sent to Berlin. In this note Secretary Lansing informed the German government that its note denying any attack on the *Sussex* but acknowledging that another vessel had been torpedoed under identical circumstances as to time, place, and result confirmed the inferences the American government had drawn from information that it possessed establishing "facts in the case of the *Sussex*." A statement of facts was included in the note. It comprised the testimony of passengers on board the vessel, and proved that the *Sussex* carried no armament; that the vessel had not been employed as a troop ship, only as a ferryboat, and was following a route not used for transporting troops; that a number of pieces of metal were found which were claimed by experts to be parts of a German torpedo. In regard to the drawing made by the German submarine commander, Mr. Lansing said in effect that this had no value as proof.

The German government waited 15 days before replying to this note. On May 15, 1916, it admitted the possibility that the ship was actually the *Sussex*. On the vital question of the conduct of submarine warfare the note yielded to the American demand. After a detailed exposition of the German attitude on the whole matter of sinking merchant vessels, the note said:

"In accordance with the general purpose of visit and search and the destruction of merchant vessels recognized by international law, such vessels both within and without the area declared a naval war zone shall not be sunk without warning and without saving human lives unless the ships attempt to escape or offer resistance."

After a repetition of its plea that the United States government should aid in restoring the principle of the freedom of the seas, the note continued:

"Accordingly the German government is confident that in consequence of the new orders issued to the naval forces the Government of the United States will also now consider all impediments removed which may have been in the way of a mutual coöperation toward restoration of the freedom of the seas during the war as suggested in the note of July 23, 1915, and it does not doubt that the Government of the United States will now demand and insist that the British government shall forthwith observe the rules of international law universally recognized before the war as they are laid down in the notes presented by the Government of the United States to the British government Dec. 28, 1914, and Nov. 5, 1915. Should steps taken by the Government of the United States not attain the object it desires, to have the laws of humanity followed by all belligerent nations, the German government would then be facing a new situation in which it must reserve to itself complete liberty of decision."

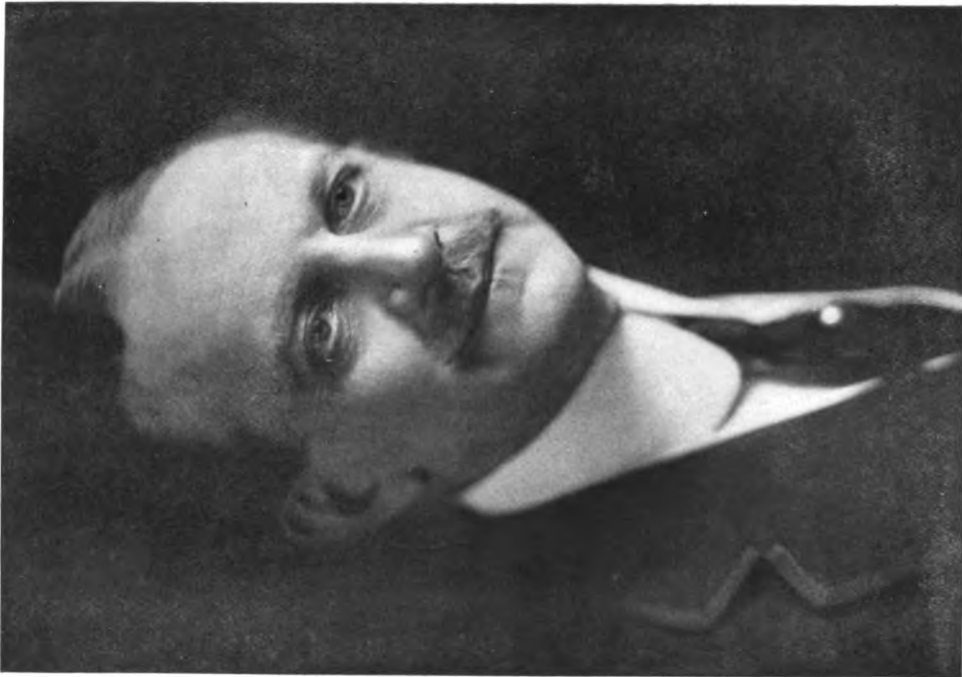
Although the German reply was as little conciliatory as words could make it, it did in fact yield to the United States government on the main issue. A response to the German note was sent three days later. After accepting the German declaration of its abandonment of its submarine policy, the note declared that:

"The Government of the United States feels it necessary to state that it takes for granted that the Imperial German government does not intend to imply that the maintenance of its newly announced policy is in any way contingent upon the course or result of diplomatic negotiations between the Government of the United States and any other belligerent government, notwithstanding the fact that certain passages in the Imperial government's note of the fourth instant might appear to be susceptible to that construction.

"In order, however, to avoid any possible misunderstanding the Government of the United States notifies the Imperial government that it cannot for a moment entertain, much less discuss, a suggestion that respect by German naval authorities for the rights of citizens of the United States upon the high seas should in any way or in the slightest degree be made contingent upon the conduct of any other government affecting the rights of neutrals, and non-combatants. Responsibility in such matters is single, not joint; absolute, not relative."

This exchange of notes for the time being settled the question. On May 8, 1916, the German government sent a further communication in which it practically acknowledged that it had been wrong in its assumption that the *Sussex* had not been destroyed by German submarines. It declared that an error had been made by the submarine commander in taking the boat for a British transport. It acknowledged error and promised to pay an adequate indemnity to the injured American citizens, and declared that the commander of the submarine had been appropriately punished.

THE CASE OF THE APPAM. The appearance of a captured British steamer, the *Appam*, in Newport News, Va., on Feb. 1, 1916, in charge of a German naval lieutenant and a prize crew involved the United States in new maritime difficulties with the belligerents. The *Appam* was captured by a German raider, *Moewe*, off Madeira, and was crowded with passengers, crews,



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**COUNT JOHANN HEINRICH VON BERNSTORFF**  
German Ambassador to the United States

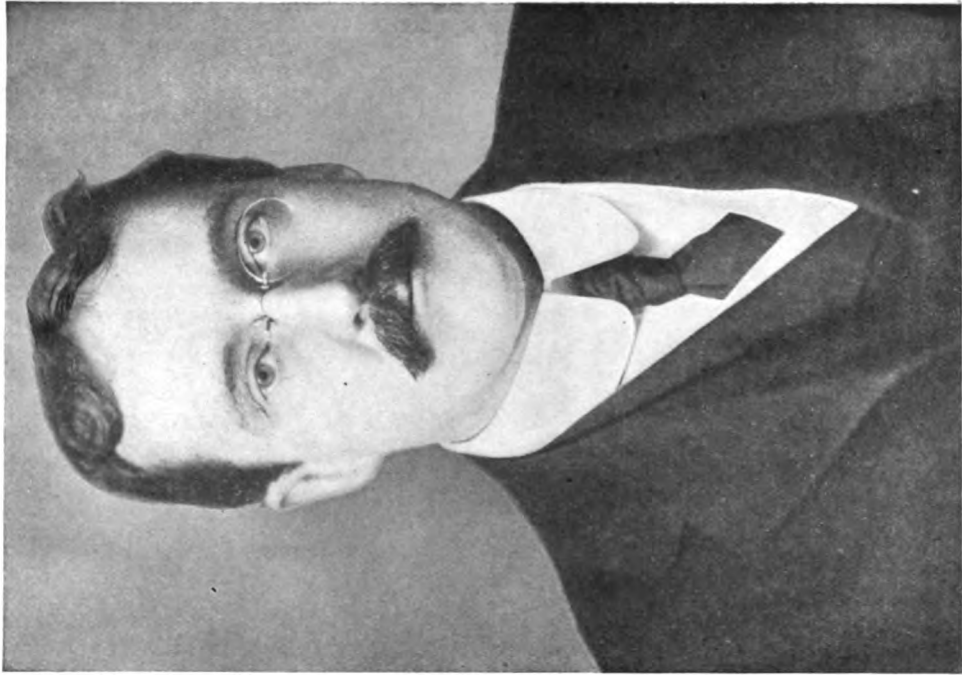


Photo. by Paul Thompson, New York  
**JUDGE JAMES WATSON GERARD**  
American Ambassador to Germany



and German prisoners taken from a number of other ships sunk by that vessel. Lieutenant Berg, the commander of the *Appam*, sought refuge in an American port, and claimed for his prize the privilege of asylum under the protection of American laws until he chose to leave. Count von Bernstorff, the German ambassador, immediately notified the State Department that Germany claimed the *Appam* as a prize under the Prusso-American treaty of 1828, and would contend for possession of it. The British government contested the German claim by demanding the release of the *Appam* under the Hague Convention of 1907. This treaty provided that merchantmen prizes could only be taken into a neutral port under certain circumstances of distress, injury, or lack of food, and that if she did not depart within a stipulated time the vessel could not be interned, but must be restored to her original owner with her whole cargo. The owners of the *Appam*, the English Navigation Company, brought suit in the Federal courts for the possession of the vessel on the ground that having been brought into a neutral port she had lost her character as a German prize, and must be returned to her owners. In the meantime the *Appam* was seized by Federal marshals under instructions from the United States district court. The case was heard at Norfolk, in May, 1916, by Judge Waddill. The German ambassador protested against the suit being permitted to proceed, as the *Appam* flew the German naval flag, and belonged to the German government. He requested the internment of the *Appam* in the American port for the remainder of the war under article 19 of the Prusso-American Treaty of 1799, and asked for the immediate dismissal of the suit through action of the Department of Justice. Secretary Lansing denied this request, on the ground that the treaty is applicable only to prizes brought to American ports by vessels of war. Judge Waddill gave his decision on July 29th. He held that the *Appam* lost her status as a prize when she entered American territorial waters, to remain indefinitely. He rejected the German contention that the Prusso-American Treaty of 1799 permitted German prizes to be laid up in American waters. "The court's conclusion," he said, "is that the manner of bringing the *Appam* into the waters of the United States, as well as her presence in those waters, constitutes a violation of the neutrality of the United States; that she came in without bidding or permission; that she is here in violation of the law; that she is unable to leave for lack of a crew, which she cannot provide or augment without further violation of neutrality; that in her present condition she is without lawful right to be in and remain in these waters; that she, as between her captors and owners, to all practical interest and purposes must be treated as abandoned and stranded upon our shores, and that her owners are entitled to restitution of their property, which this country should award irrespective of the prize court proceedings of the Court of the Imperial Government of the German Empire, and it will be so ordered." The German embassy took steps to appeal from this decision and to carry the case to the United States Supreme Court.

DISPUTES WITH GREAT BRITAIN. A dispute arose in January, 1916, over the opposition to

the Trading with the Enemy act, one of Great Britain's war measures, the provisions of which were enlarged to forbid British merchant ships trading with any person or firm that, while domiciled in a neutral country, had German trade connections. The United States objected to the prohibition as constituting a future unlawful interference with the trade. It held that in war time trade of such a person or firm domiciled in a neutral country had a neutral status, and consequently was not subject to interference. Hence the goods in transit to such a trader were not subject to confiscation by a belligerent unless contraband or consigned to an enemy country.

Another difficulty which led to repeated protests on the part of the United States was Great Britain's rigid censorship of neutral mails. Charges were made in the United States Senate that the British mail censorship was using this means to obtain trade information for the benefit of British merchants. Great Britain promptly disavowed this assertion, and pointed out that the examination of letters in the trade branch of the postal service was confined to first, direct trading with the enemy; second, indirect trading with the enemy; third, trading by unauthorized persons in the British Empire in munitions of war; fourth, the discovery of intermediaries, that is, evidence that persons or firms in neutral countries are acting as intermediaries for the enemy in correspondence or business; fifth, the intercepting of any information of interest concerned with trading or finance in relation to the war, such as the economic condition of enemy countries, or the supply of, or demand for, or price of, important commodities and munitions. The American government on May 24, 1916, sent a strong protest to Great Britain, warning her that the United States would be compelled to place claims for damages against the Allied Powers for serious mail losses suffered by American citizens. Secretary Lansing claimed in this protest that important papers which could not be duplicated, had been lost through the examination by English authorities; that delays in receiving shipping documents had caused great loss and inconvenience, that business opportunities were lost by failure to get bids, specifications, and contracts, and that great embarrassment had been felt through other matters. The method of seizing mails was denounced in indignant terms. To this Great Britain replied in a note in which it was promised to facilitate the passage of innocent mails with a minimum delay after inspection.

Great Britain's method of policing the seas resulted in several protests on the part of the United States government and in one case at least resulted in representations being made which eventually forced Great Britain to surrender to the American demand. A British cruiser had stopped an American vessel, the *China*, somewhere off Shanghai, and had taken from her 38 men of various nationalities, and confined them to military barracks. After the American government had been informed that none of these subjects of the Central Powers belonged to the war forces of their respective countries the action of the British cruiser in seizing these despite the protests of the American captain was considered to be an unwarrantable invasion of the sovereignty of the American

vessels on the high seas. The American ambassador was instructed to demand the immediate release of the men. The British government defended its action on the ground that the arrested men were involved in a plot to make Manila the base for the perpetration of unneutral acts against the Allies. The United States government repeated its demand for the release of the men on the ground that none of the British arguments had any validity, and in May, 1916, they were finally released after being held as prisoners for almost three months.

Measures taken by the British government to prevent commercial transactions of whatever character with Germany through other countries resulted in considerable friction with the American government, as noted above. British firms were forbidden to trade with foreign firms suspected or known to have dealings with German agencies in any parts of the world. Early in 1916 Secretary Lansing asked Ambassador Page to convey to the British government that these acts were deemed to be "pregnant with possibilities of undue interference with American trade." The act had been framed with the object of bringing regulations controlling British trade with the enemy into greater harmony with those adopted by the French government. France, and other countries, too, held the doctrine that their nationals could not trade with an enemy no matter where he was domiciled. The old British theory had been that trading with the enemy could only be forbidden if the enemy was domiciled in enemy countries. This view was now revised, and the government decided to prohibit persons domiciled in the United Kingdom from trading with a limited number of individuals, firms, or companies, of enemy nationality under the same penalties as though they were actually trading with the enemy.

In answer to Secretary Lansing's objections the British government readily admitted the right of persons of any nationality resident in the United States to engage in legitimate commercial transactions "with any other person," but it declined to concede that this right can in any way limit the right of other governments to restrict the commercial activities of their nationals in any manner which may be desirable to them by the imposition of prohibition and penalties which are operative solely on persons under their jurisdiction.

On Jan. 27, 1916, the British government blacklisted 82 firms or companies domiciled in the United States with whom British subjects were forbidden to trade. (See FINANCIAL REVIEW.) On July 26th, the United States government sent a protest against it, condemning the issue of the blacklist as embodying a policy of arbitrary interference with neutral trade. In this note it was declared that "American citizens were entirely within their rights in attempting to trade with the peoples and governments of any of the nations now at war, subject only to well-defined international practices and understandings which the Government of the United States deems the Government of Great Britain to have too lightly and too frequently disregarded."

Further discussions on the way of trading with foreign countries arose through British attempts to curb neutral trade with the Netherlands Overseas Trust. Under a scheme to ra-

tion the neutral countries Norway, Sweden, Denmark, and Holland, restricting their imports to their estimated domestic needs, further licenses granted to British exporters to trade with these countries were discontinued. This action was taken for fear of a surplus of supplies reaching Germany through neutral channels. A check on American exports followed, by Great Britain's forbidding the Overseas Trust to accept further consignments of certain commodities from the United States for Holland, and by her refusal to grant letters of assurance safeguarding American shipments destined for the three other countries. The effect was that certain American consignments destined for Holland were stopped altogether, while countries trading with the United States and Scandinavia could not take cargoes without British assurances of safe discharge at the ports of destination. The British official view was that excessive exports from Great Britain to these countries could not very well be forbidden, while permitting them from the United States and other neutral sources. Congress gave President Wilson certain discretionary powers for trade reprisals against the countries whose governments interfered with American trade during the war. One of these measures provided for the creation of a shipping board, and empowered the Secretary of the Treasury to forbid clearance to any vessel whose owners or agents refused to accept consignments offered for transport by an American citizen for reasons other than lack of space, or inadaptability of the vessel to carry the cargo offered. Another measure, the Omnibus Revenue law, contained provisos for retaliation for the Allied blacklist of German-American firms, and the various blockades and embargoes in operation against American products. On October 10th, Lord Grey addressed to the American government a long communication intended to make plain the attitude of Great Britain in putting into effect the blacklist and other measures regulating trade. The substance of the note was that Great Britain maintained the right in this crisis to withhold facilities to those who conducted trade for the benefit of her foes. Lord Grey characterized this right as so obvious that he could not believe that the United States seriously contested the inherent privilege of a sovereign state to exercise it except under a misconception of the scope and intent of the measures taken. On October 12th, Lord Grey addressed another communication to the United States government in regard to the censorship of mails. It threw no new light on the subject. These controversies remained in this condition at the end of the year.

THE DEUTSCHLAND. One of the greatest surprises of the year was the sudden appearance in Chesapeake Bay on July 9th of a German submarine merchantman, the *Deutschland*. This vessel, the first of its kind to be constructed, left Bremen on June 24th, and proceeded to Helgoland where she remained for four days, training the crew for the long voyage, and testing the equipment. After a voyage in which she escaped notice entirely, she arrived in Baltimore. The *Deutschland* was officially classified as an unarmed merchant vessel. She carried no guns. Her gross tonnage was 791, and she carried 29 officers and sailors. The vessel was about 25 feet wide, and was propelled by two

Diesel engines of 600 horse power. Her cargo was mainly dyestuffs and chemicals, valued at about \$750,000. Great Britain and France protested against the presence of this vessel in an American port, on the ground that she was potentially a warship. Mr. Polk, acting Secretary of State, announced on July 15th that there was no reason to regard the *Deutschland* as a warship. This ruling entitled the submarine to the benefit of visit and search. After remaining in Baltimore until August 2nd, the *Deutschland* sailed for Bremen, where she arrived on August 23rd, carrying a cargo of rubber, crude metal, and a consignment of gold. It was reported that a still larger submarine merchantman, the *Bremen*, would follow the *Deutschland* but she did not arrive. The *Deutschland* arrived on a second trip in the harbor of New London, on the morning of November 1st. She made the trip without special incident. She sailed again for Germany on November 17th.

**THE EXPLOITS OF THE U-53.** An even greater surprise than the visit of the *Deutschland* was the unheralded arrival at Newport, R. I., on October 7th, of a German submarine, the *U-53*. It remained at Newport long enough to deliver a message to Count von Bernstorff, to pay a ceremonial visit to Admiral Knight, the American commander, and obtain a parcel of American newspapers. It then left the harbor and disappeared. On the following day the submarine appeared off Nantucket where, in quick succession, it sank five merchant ships, three British, one Dutch, and one Norwegian. The *U-53* then disappeared and was not again heard of up to the end of the year. This episode involved the United States government in diplomatic difficulties with the Allied Powers. The vessels destroyed were, to be sure, outside the three-mile limit. The ships struck were the *Strathdene*, British, the *West Point*, British, *Bloomersdijk*, Dutch, the *Christian Knudsen*, Norwegian, and the *Stephano*, a British passenger liner sailing regularly between New York and Halifax. Among the *Stephano's* passengers were a number of Americans. During the destruction of these vessels by the *U-53* a number of American destroyers remained in the vicinity, and commanders and crews were actual witnesses of the sinking and took part in assisting the victims of the vessels to safety. The American destroyer *Balch* rescued passengers and crew of the *Stephano* numbering 140, and other destroyers took on board crews of the four freighters.

There was much public alarm over the incident, and President Wilson found it necessary to assure the country "that the German government will be held to the complete fulfillment of its promises to the United States. I have no right to question its willingness to fulfill them." After deliberations on the part of the government officials it was decided that the *U-53* had not ignored the German pledge in that it had first warned the vessels and given time for the people on board to be safely transferred to boats and carried to safety. The incident passed as one in which no action could be taken by the United States. The Allied governments did not protest against the decision of the United States government that the *U-53* exploits were within the law. There were, however, many derogatory comments in the foreign

press, and on the part of public speakers in France and England.

**FURTHER SUBMARINE DIFFICULTIES.** Following the agreement arrived at between Germany and the United States government in regard to submarine warfare in May, there was comparatively little friction between the two governments over the issue. There were, however, Americans aboard vessels which had been sunk by German submarines. These include the *Rowanmore*, British freighter bound from Baltimore to Liverpool, sunk on October 25th, in which there were two Americans and five Filipinos; the *Marina*, a British horse carrier, bound from Glasgow to Newport News, sunk on October 29th, when six Americans lost their lives; the *Arabia*, a passenger liner, sunk on November 6th, with one American on board; and the *Columbian*, an American steamer sunk off the Spanish coast on November 8th. The *Marina* and *Arabia* carried cargoes, and Germany justified the sinking of these vessels on this ground. It was alleged that the *Rowanmore* attempted to escape, and that, therefore, its destruction was justified. It was also alleged that the *Marina* and *Arabia* were engaged in transport service. This was denied by the American government. In the case of the *Arabia* 450 passengers were on board, including women and children who were saved only because the vessel sank gradually. Germany admitted liability for sinking the *Columbian*, and agreed to pay for the value of the vessel and the contraband cargo which she carried. The case of the *Marina* was considered by the State Department as a clear violation of Germany's pledge to the United States. Her gun was not used, and no opportunity was afforded for using it. No final decision was taken on these cases at the end of the year, and negotiations were side-tracked in December by the consideration of peace proposals on the part of Germany, and the efforts of President Wilson to bring about an agreement for the consideration of peace on the part of the contestants.

See also SHIPPING.

**GERMAN PROPAGANDA IN THE UNITED STATES.** German efforts to influence public opinion in the United States took much less aggressive forms in 1916 than in the previous year. The German military attaché, Franz von Papen, who was recalled at the request of the United States government, at the end of 1915, arrived at Falmouth, England, on January 5th, under a safe conduct for his person only. His baggage was examined by the English authorities, and it was shown by his check-book and other documents that he had paid out considerable sums of money to persons who had been involved in secret service work on the part of the German government in the United States. On February 8th Consul-General Bopp and others were indicted by the Federal grand jury in San Francisco on charges of conspiracy to interfere with commerce under the Anti-Trust act, and for conspiracy to organize a military expedition. In addition to the Consul-General a number of officers attached to the consulate were indicted. All were involved in alleged plots to blow up Canadian tunnels and American powder mills. These indictments were the first which the United States had attempted to secure against any foreign representative. The defendants were found guilty. Arguments in the appeal

of Werner Horn, indicted for illegally transporting dynamite in an attempt to blow up the international bridge at Vanceboro, Me., on Feb. 2, 1915, were heard by the Federal Circuit Court of Appeals in Boston on February 2nd. A commission appointed to examine Horn as to his sanity declared him sane. The court decided, on April 27th, that Horn must stand trial. It denied his application for a writ of habeas corpus. There were no further developments in the case during the year. Ignatius T. T. Lincoln, who had confessed himself to be a German spy and was arrested at the request of the English government, escaped on January 15th, but was rearrested on February 19th. Lincoln appealed from the decision of the Federal district court of New York which refused to release him on habeas corpus, to the United State Supreme Court. The latter court, on May 1st, affirmed the judgment of the District Court, and he was taken under guard to London on May 27th, arriving on June 6th. After a preliminary hearing at the conclusion of which he was committed for trial he pleaded guilty on June 19th. Paul Koenig, head of the Bureau of Investigation of the Hamburg-American Steamship line, was arrested on January 11th. The charge made against him was that he was in coöperation with Frederick Schleindel, a clerk in the National City Bank, who had been arrested on Dec. 17, 1915, charged with having stolen from the bank documents containing information of munition shipments to the Allies. Capt. Hans Tauscher, American representative of the Krupp Gun Works, and husband of Madame Johanna Gadski, the grand opera singer, was arrested in New York City on May 30th on the charge of planning to blow up the Welland Canal in Canada. The chief evidence against him was furnished by Horst von der Goltz, a German propagandist, who was released from the Tower of London and was sent to New York to testify in cases regarding German breaches of neutrality. This was the second alleged plan to destroy this canal, the first having been organized, it was said, by Paul Koenig, who is referred to above. Captain von Papen, who had been recalled to Germany, was, on April 17th, indicted by a Federal grand jury as one of the heads of this conspiracy. It was the first time in the history of the country that a man had been indicted who was an accredited diplomatic representative of a foreign power at the time the offense alleged in the indictment was committed. In addition to Captain von Papen four others were named in the indictment, Wolf von Igel, former secretary to Captain von Papen, Captain Tauscher, Captain Boy-Ed, former German naval attaché, and Franz von Rintelen, a German agent whose activities had previously been under investigation by the Federal grand jury. Von Igel was arrested on April 18th. He protested that he was under the protection of the German embassy and was immune from arrest. He was released on \$20,000 bail. Count von Bernstorff, the German ambassador, demanded his release and the return of documents seized from his office. These documents were said to connect high officers in the German diplomatic service with the plot to blow up the Welland Canal, and with many bomb outrages on ships carrying munitions. The documents were photographed and the copies sent to Washington. The State Department an-

nounced on April 21st that it would return any of the papers that might be pointed out as German embassy documents. Count von Bernstorff declared that von Igel's office in New York City was a part of the German embassy, but this was denied by United States officials. Captain Tauscher was tried on the charge of conspiracy, and was found not guilty on June 30th. Practically the only witness against him was von der Goltz, the German agent, whose evidence Judge Hand, who presided at the trial, declared was not conclusive under the circumstances. Franz von Rintelen was indicted on May 26th by a Federal grand jury, as the basis of a demand by the Federal authorities for his extradition. The indictment charged von Rintelen with fraud in connection with his procurement of an American passport.

On April 12th four men charged with complicity in manufacturing fire bombs to be placed aboard ships carrying munitions and supplies to the Allies were arrested by agents of the Department of Justice acting with the New York police. They were Ernest Becker, an electrician, Capt. Charles von Kleist, superintendent of the New Jersey Agricultural and Chemical Company, Capt. Otto Wolpert, superintendent of piers of the Hamburg-American line, and Capt. Enno Bode, also superintendent of piers for this line. The arrests were the result of investigations which had been carried on since June, 1915, when the French government complained to the State Department that unexploded bombs had been found in sugar bags aboard the steamship *Kirk Oswald*. Four other German subjects, engineers on the North German Lloyd liner *Friedrich der Grosse* laid up in Hoboken, were arrested on April 12th. All these men were indicted on April 28th. No action was taken on these cases at the end of the year. On May 18th, Count von Bernstorff informed Secretary Lansing that he had issued instructions to all German consuls in the United States to admonish all German subjects to abide by the laws of the United States, this action being taken under direct orders of the Berlin Foreign Office. It was unexpected, as the United States government had made no representations which could have called forth the warning. Following this statement there was a great falling off in the activity of German agents in the United States. Lieut. Robert Fay, who had been convicted in a conspiracy to blow up munitions ships of the Allies, escaped from the Federal prison in Atlanta, Ga., on August 29th. A companion who escaped with him was recaptured on September 9th, in New York City. Fay was not recaptured.

EXPLOSIONS IN MUNITIONS PLANTS. There were, during the year, several explosions in munitions plants, but in no case was the result traced directly to malicious intent on the part of enemies of the Allies. On January 10th, a portion of the Du Pont Powder Works at Kearney's Point, N. J., exploded. Several men were killed. Another plant of this company at Gibbstown, Pa., was blown up on May 15th, when 14 men were killed and about 30 injured. On July 30th, property loss estimated at \$25,000,000 was caused by a series of terrific explosions of ammunition which was awaiting shipment on Black Tom Island, a small strip of land in New York Bay, off Jersey City, N. J. Following the explosion fire started,



and destroyed 13 warehouses owned by the National Storage Company on the island, in which was stored merchandise valued at between \$12,000,000 and \$15,000,000. Evidence indicated that fire started in a barge which had been moored alongside the railroad dock. Several investigations were made as to the cause of the explosion but no definite conclusion was arrived at. It had the result, however, of causing the State and city governments to prohibit storage of munitions where communities would be endangered. The Secretary of War also took action and on October 17th stated that regulations would be put into effect permitting only "unfixed" ammunition of low destructive power to be loaded in New York Bay.

**UNITED STATES AND PEACE.** The Ford Peace Expedition which sailed from New York in the latter part of 1915, with the object of bringing about immediate peace among the warring countries, failed of its object. Mr. Ford himself returned to New York on Jan. 1, 1916. The party which had landed at Copenhagen went from there to The Hague on January 6th and 7th. In that city a permanent conference was formed, including delegates from neutral countries, and William J. Bryan, Mr. Ford, Dr. Aked, Jane Addams, and Mrs. Fels were elected American members. It was planned that the permanent peace board should sit in Europe indefinitely for the purpose of using all efforts to settle the war. About 150 members of the party returned to the United States in the latter part of January, 1916. On March 10th, Madame Rosika Schurmmmer, who was credited with having originally planned the peace trip, retired from the permanent peace board. On July 25th Dr. Aked resigned as chairman of the American committee to the peace conference, at Stockholm, because he declared the conference had utterly failed in its object of bringing about peace. Miss Jane Addams made an extended tour through neutral countries during the first part of the year, and on her return made a number of addresses on the general subject of peace.

There were in the latter part of the year rumors from various sources that Germany desired to bring about peace on whatever terms she could best command. The general subject of such efforts does not belong properly to this article. (See **WAR OF THE NATIONS**.) Here will be considered only the relations of the United States and efforts to bring about a situation where peace at least might be discussed. The German government sent to the United States as well as to other neutral countries a note on December 12th in which it suggested that the time had come for some definite effort to bring about a condition of peace. The note contained the following passage: "Our aims are not to shatter or annihilate our adversaries. In spite of our consciousness of our military and economic strength, and our readiness to continue the war, which has been forced upon us, to the bitter end if necessary; at the same time prompted by the desire to avoid further bloodshed, and to make an end to the tragedies of war, four allied Powers propose to enter forthwith into peace negotiations. If in spite of this offer of peace and reconciliation the struggle should go on the four allied Powers are resolved to continue to a victorious end, but they disclaim responsibility for this before humanity

and history." This note was transmitted by the United States government to the Entente Powers without comment. It became known on December 20th that on December 18th, the day prior to the date on which President Wilson had transmitted to the Entente Powers the German note of December 12th, Secretary Lansing had sent to the American diplomatic representatives in the warring countries the following communication:

"The President directs me to send you the following communication to be presented immediately to the minister of foreign affairs of the government to which you are accredited:

"The President of the United States has instructed me to suggest to the [here is inserted a designation of the government addressed] a course of action with regard to the present war, which he hopes that the government will take under consideration as suggested in the most friendly spirit, and as coming not only from a friend but also as coming from the representative of a neutral nation whose interests have been most seriously affected by the war and whose concern for its early conclusion arises out of a manifest necessity to determine how best to safeguard those interests if the war is to continue.

[The third paragraph of the note as sent to the four Central Powers—Germany, Austria-Hungary, Turkey, and Bulgaria—is as follows:]

"The suggestion which I am instructed to make the President has long had it in mind to offer. He is somewhat embarrassed to offer it at this particular time, because it may now seem to have been prompted by a desire to play a part in connection with the recent overtures of the Central Powers. It has, in fact, been in no way suggested by them in its origin, and the President would have delayed offering it until those overtures had been independently answered but for the fact that it also concerns the question of peace and may best be considered in connection with other proposals which have the same end in view. The President can only beg that his suggestion be considered entirely on its own merits and as if it had been made in other circumstances.

[The third paragraph of the note as sent to the 10 Entente Allies—Great Britain, France, Italy, Japan, Russia, Belgium, Montenegro, Portugal, Rumania, and Serbia—is as follows:]

"The suggestion which I am instructed to make the President has long had it in mind to offer. He is somewhat embarrassed to offer it at this particular time, because it may now seem to have been prompted by the recent overtures of the Central Powers. It is, in fact, in no way associated with them in its origin, and the President would have delayed offering it until those overtures had been answered but for the fact that it also concerns the question of peace and may best be considered in connection with other proposals which have the same end in view. The President can only beg that his suggestion be considered entirely on its own merits and as if it had been made in other circumstances.

[Thenceforward the note proceeds identically to all the powers, as follows:]

"The President suggests that an early occasion be sought to call out from all the nations now at war such an avowal of their respective views as to the terms upon which the war might be concluded and the arrangements which would be

deemed satisfactory as a guaranty against its renewal or the kindling of any similar conflict in the future as would make it possible frankly to compare them. He is indifferent as to the means taken to accomplish this. He would be happy himself to serve, or even to take the initiative in its accomplishment, in any way that might prove acceptable, but he has no desire to determine the method or the instrumentality. One way will be as acceptable to him as another, if only the great object he has in mind be attained.

"He takes the liberty of calling attention to the fact that the objects, which the statesmen of the belligerents on both sides have in mind in this war, are virtually the same, as stated in general terms to their own people and to the world. Each side desires to make the rights and privileges of weak peoples and small states as secure against aggression or denial in the future as the rights and privileges of the great and powerful states now at war. Each wishes itself to be made secure in the future, along with all other nations and peoples, against the recurrence of wars like this and against aggression or selfish interference of any kind. Each would be jealous of the formation of any more rival leagues to preserve an uncertain balance of power amid multiplying suspicions; but each is ready to consider the formation of a league of nations to insure peace and justice throughout the world. Before that final step can be taken, however, each deems it necessary first to settle the issues of the present war upon terms which will certainly safeguard the independence, the territorial integrity, and the political and commercial freedom of the nations involved."

Following the sending of this note several explanatory statements were made in regard to it. Secretary Lansing issued a statement to the public in which he said:

"It isn't our material interests which we had in mind when the note was sent, but more and more our own rights are becoming involved by the belligerents, on both sides, so that the situation is becoming increasingly critical.

"I mean by that that we are drawing nearer the verge of war, and therefore we are entitled to know what every belligerent seeks in order that we may regulate our conduct in the future.

"The sending of this note will indicate the possibility of our being forced into the war. That possibility ought to serve as a restraining and sobering force safeguarding American rights. It may also serve to force an earlier conclusion of the war."

Still another statement was issued by Secretary Lansing in which he said of his first statement: "My intention was to suggest the very direct and very necessary interest which this country as one of the neutral nations has in the possible terms which the belligerents may have in mind, and I did not intend to intimate that the country was considering any change in its policy of neutrality, which it has constantly pursued in the face of constantly increasing difficulties."

The immediate effect of the President's note was one of surprise and bewilderment on the part of the public, both in the United States and in Allied countries. Resentment was especially felt in France and England, that President Wilson apparently placed the belligerent

powers on the same footing. On further consideration, however, it was finally conceded that the note would have a salutary effect if it were taken literally as written.

Germany was the first of the countries at war to answer President Wilson's request. A note sent on December 17th was brief and evasive. The German government declined to be drawn into stating its peace terms. It declared that as President Wilson had left open the choice of road an immediate exchange of views seemed to be the most appropriate method in order to reach the desired result. It proposed therefore an immediate meeting of delegates of the belligerent states at a neutral place. The German government stated moreover that it was of the opinion that the great work of preventing future wars can be begun only after the present war is over, "when it would be pleased to collaborate with the United States in that exalted task."

The answer of the Allied Powers to the original German peace proposal came on Dec. 30, 1916. It was, in effect, a summing up of the cause of the Allies, and an assertion that peace could not be secured without reparation, restitution, and assurance of the impossibility of further warfare on the part of Germany. The Allies had not replied to President Wilson's note at the end of the year.

See also WOMAN MOVEMENT.  
**UNITED STATES COMMISSION ON INDUSTRIAL RELATIONS.** See INDUSTRIAL RELATIONS COMMISSION.

**UNITED STATES DEPARTMENT OF AGRICULTURE.** In his annual report for 1916 the Secretary of Agriculture briefly summarizes the achievements of the present administration along the lines of rural economics, including especially the marketing of farm products, rural finance, and rural organization. Attention is called to the creation and development of the Office of Markets and Rural Organization, which has already become one of the large Bureaus of the Department, its appropriation for 1916-17 aggregating \$1,242,000. "Today the nation possesses the largest and best trained and supported staff of experts dealing with the distribution of agricultural commodities and rural organization to be found anywhere in the world. It is engaged in investigating all the larger and more difficult problems confronting farmers in this new field."

Among the results of the Department's activities in this direction was the enactment of the Cotton Futures act, the United States Grain Standards and Warehouse acts, the Federal Farm Loan act, and the Federal Aid Road act. (See AGRICULTURE and AGRICULTURAL LEGISLATION.) The great force of extension agents cooperatively employed by the Department, the State agricultural colleges, and the counties (see AGRICULTURAL EXTENSION WORK) is also largely engaged in diffusing among the farmers information bearing on their economic problems, as well as on those relating to agricultural production, and is aiding them to form effective organizations for economic and social purposes.

Discussing the food supply of the United States the Secretary points out that while our population during the past 16 years has increased 33 per cent the per capita production of poultry, eggs, fish, cereals, potatoes, and vegetables has remained approximately the same

or has increased. Only in the case of meats and dairy products has there been a decrease. The Department, as well as the State Experiment Stations, is actively engaged in efforts to increase meat production (1) by checking and eliminating diseases and parasites and (2) by increasing and improving stock raising. Much is also being done to increase and stabilize crop production by extension of areas of production, increase of yields per acre, and control of insects and plant diseases. The campaign to standardize manufactured food products, maintain their purity, and improve their quality is being actively prosecuted.

Important legislative and administrative developments in connection with the national forests occurred in 1916. As the result of progress in classification of the lands included in these forests several million acres were restored to the public domain or opened to entry under the forest homestead act. On July 1, 1916, there remained in public ownership 155,420,280 acres. The forests were more fully equipped with roads, timber sales were increased, nearly three-fourths of a million head were added to the live stock grazed in these forests, mining activities were stimulated, and there was a broader use of the forests for recreation and health. Some confusion has arisen from the administration of the national forests and the national parks by the Departments of Agriculture and the Interior. The Secretary of Agriculture therefore recommends that the transfer of the administration of the parks to his Department should be considered.

A division of agricultural meteorology was established in the Weather Bureau. In addition to the continuance of efforts to prevent crop losses by warnings of adverse conditions, studies will be made on the relation of the environmental factors in climate to the growth of plants and the production of crops. The effect of weather and climate on the factors of plant growth, including critical periods in the development of plant life, will be investigated. The co-operation of the State Agricultural Experiment Stations in this work has been enlisted.

The appropriations for the Department for the year ended June 30, 1916, amounted to \$22,971,782 for ordinary expenses, in addition to permanent and special appropriations amounting to \$7,490,412, making a total of \$30,462,194.

The appropriations for the year ending June 30, 1917, for ordinary expenses amounted to \$24,948,852, in addition to permanent and special appropriations amounting to \$12,240,000, making a total of \$37,188,852. This includes material increases of funds for marketing studies, the eradication of the cattle tick in the South, the combating of rabies in the Rocky Mountain States, and the farmers' cooperative demonstration work in the North and West. It inaugurates a market news service and studies of methods for obtaining potash on a commercial scale. It provides \$3,000,000 for additional purchases of forest lands in the White and Appalachian Mountains. Among the permanent appropriations are \$5,000,000 for construction of rural post roads, \$3,000,000 for meat inspection, and \$1,580,000 for cooperative agricultural extension work. The appropriation for printing and binding, carried in the Sundry Civil Act, was increased from \$500,000 to \$600,000.

In 1916 the Department issued 1038 new pub-

lications and a large number of reprints, aggregating more than 39,000,000 copies. The library now contains 138,000 books and pamphlets, mainly on agriculture and agricultural science, and currently receives 2280 periodicals.

There were 17,176 employees on July 1, 1916, of whom 3976 were employed in Washington. The number of women employed was 2145.

**UNITED STATES INDIAN TRAINING AND INDUSTRIAL SCHOOL.** See INDIAN TRAINING AND INDUSTRIAL SCHOOL.

**UNITED STATES MILITARY ACADEMY.** (West Point, N. Y.) On September 1, 1916, the beginning of the academic year, the total strength of the United States Corps of Cadets (students at the academy) was 769. Including all administrative officers the instructors numbered 128. On July 1st Col. (now General) Clarence Page Townsley, Coast Artillery Corps, U. S. A., was relieved as superintendent and commandant of the academy by Col. John Biddle (q.v.), Corps of Engineers, U. S. A. For the fiscal year ending July 1, 1916, the academy received from government appropriations \$279,553 and \$240,244 was disbursed. The library contains 95,000 volumes.

Important changes in West Point were contemplated in 1916 with a view to greatly enlarging its capacity. By an act of Congress approved May 4, 1916, the corps of cadets as now constituted consists of two from each Congressional district, two from each Territory, four from the District of Columbia, two from Porto Rico, four from each State at large, and 80 from the United States at large, 20 of whom are to be selected from among the honor graduates of educational institutions having officers of the regular army detailed as professors of military science and tactics. They are to be appointed by the President. The President is also authorized to appoint cadets from among enlisted men of the regular army and the national guard, between the ages of 19 and 22 years, who have served as enlisted men not less than one year. The total number selected is not to exceed 180 at one time. The increase provided for in this act is divided into four annual increments. Under the apportionment of members of Congress according to the 13th census, the number of cadets can reach a maximum of 1332.

The superintendent of the academy in his report for 1916 comments upon the change here noted and discusses the urgent need for new buildings to meet the increase. A board of officers consisting of Maj.-Gen. Hugh L. Scott, Maj.-Gen. Tasker H. Smith, Brig.-Gen. Enoch H. Crowder, Brig.-Gen. Henry T. McCain, and Colonel Townsley, the superintendent, approved plans which ask for increased appropriations totaling \$3,074,079. The chief items were: mess hall, barracks, hospital, and laundry (all for cadets); officers' quarters; new roads, quarry work, etc.; and fees of architect and consulting engineers. In addition, changes in the plant will continue to be made in accordance with improvement plans approved in 1904 and 1916. In his report, the superintendent urged that before candidates take the West Point entrance examination, they should be required to pass competitive entrance examinations in each district and State. He also advised that the military academy be made an exception to the operation of the detached service law so that officers

might be detailed as instructors for four years regardless of any other detached service they may have had. The report discusses the recently initiated plan of granting admission to the academy by certificate from certain schools and colleges as well as by examination. Such certificate applies only to mental qualifications. Out of 1058 candidates examined in the March and June entrance examinations, 124 qualified both mentally and physically in March and 67 in June. In the former month three Filipino candidates were examined and one qualified.

**UNITED STATES NATIONAL MUSEUM.** Various collections—scientific, historical, artistic, and industrial—belonging to the government are housed in the National Museum at Washington under the custody and supervision of the Smithsonian Institution (q.v.). Many of the investigators and explorers sent out by the Institution are officially connected with the Museum. The most important event of many years for the Museum and the Institution was the action of Mr. Charles L. Freer. In 1906 Mr. Freer presented to the Museum a collection of objects of art, stipulating that it remain in his ownership during his life. This condition he has now removed and the collection passes into the hands of the government. Mr. Freer also gave \$1,000,000 to erect a suitable building on the Smithsonian reservation in Washington. At the end of the year construction was about to begin, Mr. Charles A. Platt of New York serving as the architect. The original collection consisted of 2300 items. At the end of 1916 there were 5346, of which 535 were added during the year (23 paintings and sculptures by American artists and 512 oriental objects). The division of the National Museum which has charge of this collection is known as the National Gallery of Art. The Gallery also received during the year from the Department of State a collection of 82 drawings by contemporary French artists, presented to the people of the United States by the citizens of France in recognition of American war relief work.

Specimens to the number of 243,733 were received by the National Museum during the year in the following departments: Anthropology; zoölogy; botany, geology and mineralogy; paleontology; textiles, woods, and other animal and vegetable products; mineral technology; and National Gallery of Art. Important additions were made in the field of American history. Mr. Walter G. Peter loaned many objects once the property of General and Mrs. Washington, and the valuable loan collection of memorials of Gen. W. T. Sherman was given into the permanent keeping of the Museum. An important exhibition of the year was that arranged by the government in the Museum, February 21-27. Inspired by the "Safety First" idea, it was participated in by 20 government bureaus, the American National Red Cross, and the Washington metropolitan police department. During the week 35,447 visitors attended the exhibition. Richard Rathbun is assistant secretary, in charge of the Museum.

**UNITED STATES NAVAL ACADEMY.** (Annapolis, Md.) At the beginning of the academic year 1916-17 there were 1230 undergraduates (midshipmen) enrolled in the Naval Academy and 66 postgraduates. Including the postgraduate department, the faculty numbered

173. For the fiscal year ending June 30, 1917, the sum of \$703,946.92 was appropriated by Congress. The library contains 55,600 volumes. Much public attention was called to the academy when on February 11th Secretary Daniels approved a recommendation of the academy board that 82 midshipmen be dismissed for failure in their studies. Upon recommendation of the Navy Department, the 63rd Congress reenacted a law providing for the apportionment of two midshipmen to each member of Congress, but the succeeding Congress passed a bill increasing this number to three, thus providing for 531 additional midshipmen in a year. On February 16th President Wilson signed a bill which had passed the Senate without a dissenting vote, providing for increasing the entrance class at Annapolis by 300. This was one of the first of the national defense bills. Superintendent, Capt. Edward W. Eberle.

**UNITED STATES SHIPPING BOARD.** See SHIPPING BOARD, UNITED STATES.

**UNIVERSALISTS.** There were in the United States and its possessions in 1916, 58,300 members of this denomination. They had also 662 ministers and 865 churches. This represented a gain over 1915 of 3300 members, 6 ministers, and 102 churches. The Sunday schools had over 50,000 pupils. The Commission on Social Service, established in 1910, carries on social work, and in 1916 continued the educational task of stimulating interest in the subject among ministers, divinity students, men's clubs, women's societies, and young people's societies. Social service information is exchanged through the church press, and social service topics are discussed at church gatherings. The denomination carries on foreign missionary work in Japan and China. The institutions of higher education are: Tufts College, at Medford, Mass.; St. Lawrence University, Canton, N. Y.; Buchtel College, Akron, Ohio; and Lombard College, Galesburg, Ill.

**UNIVERSITIES AND COLLEGES. BENEFACCTIONS FOR HIGHER EDUCATION.** The report of the United States Bureau of Education shows that the sum of \$31,357,398 was given and bequeathed to education in 1914. Of this amount \$26,670,017 was for universities and colleges, \$1,558,281 for theological schools, and \$1,495,773 for law schools. The report shows that since 1896 sums aggregating \$407,000,000 have been given by private donors. During 1916 the following institutions have reported gifts and bequests of \$100,000 or more: Amherst College received \$250,000 for a library and \$100,000 from Mrs. Rufus Pratt Lincoln; Columbia University, \$600,000 from an anonymous donor to construct a building for the School of Business, \$10,000 from Mr. James N. Jarvie, and \$100,000 from the estate of Emil C. Bondy; Davis and Elkins College, \$100,000 by will of Henry Gassoway Davis; Haverford College, \$409,321 from T. Wistar Brown and \$100,000 by wills of Edith and Walter Scull; Johns Hopkins University, \$150,000 by will of Miss Jessie Gillender; Lafayette College, about \$250,000 as residuary legatee of Albert N. Seip; Massachusetts Institute of Technology, a total of \$2,200,000—\$800,000 coming from members of the DuPont family and \$200,000 from four alumni; Northwestern University, \$134,000 from Mr. James A. Pattan; Princeton University, by will of William Watson Lawrence, received residue of estate

valued at \$750,000; Union Theological Seminary, \$1,840,000 from an anonymous giver; University of Buffalo, actual and provisional gifts to the amount of \$750,000; University of Chicago, for new medical school, \$4,000,000, and \$300,000 from Mr. Frederick H. Rawson; University of Pennsylvania, \$400,000 by will of Dr. J. William White and also gift of \$600,000; University of Vermont, \$100,000 from Gen. Rush C. Hawkins; University of Virginia, \$250,000 from anonymous giver; Vassar College, completed endowment of \$1,000,000; Washington Medical School, \$1,000,000 from anonymous giver; Wellesley College, \$150,000 from a graduate; Western Reserve University, about \$500,000 by will of Robert R. Rodes and \$110,000 from John L. Severance; Yale University, \$500,000 by will of Charles W. Harkness.

**CARNEGIE FOUNDATION FOR THE ADVANCEMENT OF TEACHING.** The 10th annual report of the president and of the treasurer of the Carnegie Foundation for the Advancement of Teaching was issued during the early part of 1916. It covers the year ending Sept. 30, 1915. The report shows that the total assets of the General Endowment are \$14,129,000 and of the endowment of the Division of Educational Enquiry \$1,250,000. The income from the General Endowment was \$697,892.54 and from the endowment of the Division of Educational Enquiry \$50,300.50. The total expenditures from the General Endowment were \$712,852.78. Of this sum \$473,989.38 was granted as retiring allowances and pensions to 257 professors and officers in accepted institutions, \$99,850.81 as retiring allowances and pensions to 70 professors and officers now in accepted institutions, \$80,152.31 to 97 widows of professors and officers in accepted institutions, and \$20,752.47 to 27 widows of professors and officers not in accepted institutions. The average amount of allowance for professors and officers on the accepted list was \$1900 on the basis of age or service, and \$1280 on the basis of disability. The average allowance for widows of professors and officers in accepted institutions was \$940. The expenses of administration were \$36,550.93. The total expense of the Division of Educational Enquiry was \$54,633.62. The cash balance of the General Endowment was \$104,673.63, and of the Division of Educational Enquiry \$4016.64. The report states that during the year the Foundation had studied engineering education in cooperation with a joint committee of the National Engineering Society. A study of the training of teachers in Missouri was also in progress.

**COLLEGE ADMISSION REQUIREMENTS.** Four women's colleges, Mount Holyoke, Smith, Vassar, and Wellesley, have announced a new method of admission to supersede the present system of admission by certificate. In 1919 the new method will entirely replace admission by certificate and it may be used earlier if desired. The present method of admission by examination in all subjects will be continued as an alternative to the new plan. No change is made in the subjects now required for admission; no addition nor diminution in the amount prescribed for admission is proposed. The new plan is similar to that adopted by Harvard, Princeton, and Yale in prescribing a test of the quality of the applicant's scholarship and intellectual power.

The examinations required in this plan are

of the type known as comprehensive examinations to be offered by the College Entrance Examination Board beginning in June, 1916.

The new method depends on two kinds of evidence:

1. Evidence submitted by the school, consisting of
  - a. A school report covering the entire record of subjects and grades for four years.
  - b. A statement from the school principal including an estimate of the applicant's scholarly interests, special ability, and character.
2. Evidence submitted by the candidate, consisting of four comprehensive examinations, selected from each of the following groups:
  - (1) English or History, selected by the applicant.
  - (2) A foreign language, selected by the applicant.
  - (3) Mathematics, or chemistry, or physics, selected by the applicant.
  - (4) A fourth subject, designated by the applicant from the subjects which may be offered for admission. This choice must be approved by the Committee on Admission of the respective colleges.

These four examinations must be taken at one time.

At least two examinations must cover more than two admission units each.

In each subject chosen the comprehensive examination covering all the units offered by her for admission must be taken by the applicant.

Under the new plan the candidate, if admitted to college, will be admitted free from all conditions. Failure to meet completely the standard in both kinds of evidence required will not necessarily involve the rejection of the applicant; the committee may accept unusual excellence in one part of the credentials submitted as offsetting unsatisfactory evidence or even failure in another part. If the candidate fails of admission in June she will not be debarred from taking examinations under the old system in September, but she may not take the comprehensive examinations for admission under the new plan before June of the following year.

This plan substitutes a uniform method of administration in place of the various certificate forms now used by the four colleges and gives the preparatory school entire freedom in the sequence of its work, making no requirements of certain subjects in the last years.

Comprehensive examinations according to the new plan will be given by the College Entrance Examination Board in June, 1916, and thereafter, and applicants may enter college by satisfying these tests and furnishing the required evidence from their schools at any examination period before 1919, though this new plan will not entirely supersede admission by certificate until that date.

Other universities have also made changes in their entrance requirements. The University of Wisconsin has established a course leading to the degree of Bachelor of Philosophy. The requirements of this course will be similar to those for the Bachelor of Arts degree except that a more extensive study of English, natural sciences, and mathematics will be required in

place of a foreign language. "The entrance requirements of the College of Letters and Science have been changed so that the six units required of all students are two units of English, two units of mathematics, and two units of foreign language or science or history."

After 1920 Syracuse University will grant but one degree in the College of Liberal Arts. This will be the degree of Bachelor of Arts. Latin has been made optional as an entrance requirement.

The trustees of Columbia College at their May meeting abolished Latin as a required subject in the college curriculum. They have also abolished the degree of Bachelor of Science. "Hereafter all students registered in Columbia College, whether they take the 'straight college' course or one of the combined courses (college and law, college and medicine, and the like), will be candidates for the degree of Bachelor of Arts." The *Columbia Alumni News*, commenting on this departure, says, "It is a good thing for the classics to be put on a strictly voluntary basis. A man studies better the subject of his choosing than the subject prescribed for him. The department has already proved, by its popular sophomore courses, that it can attract and hold men beyond the minimum requirement, and under the new régime the courses in freshman Latin ought to show that the classics can be taught in such a way as to demonstrate their value even to the somewhat obtuse and skeptical freshman mind." The degree of B.S. will now be given by the university only upon the completion of work in one of the scientific schools. The degree of B.S. in medicine will be given at the end of two years of work in the Medical School following two years of college work.

**FACULTY PARTICIPATION IN COLLEGE AND UNIVERSITY ADMINISTRATION.** Various cases of alleged breach of academic freedom involving Lafayette College, the University of Utah, and the University of Pennsylvania have served to call attention to the need of some method of faculty participation in the administration of colleges and universities. During 1916 several institutions took important steps in this direction. On April 29th the trustees of Cornell University adopted the following resolutions:

*A Resolved*, That the faculty of each college located at Ithaca, except the State colleges, be invited from time to time to select two of its members who, with the dean of such a faculty, shall constitute a committee to meet as often as desired with the committee on general administration, the committee on finance, or the committee on buildings and grounds (according to the nature of the matter) for the consideration of questions affecting the welfare of such college; that the members of such committee other than the dean shall be selected by ballot and for definite terms or as each occasion for conference arises and under such conditions as may be provided by the faculty selecting them.

*B Resolved*, That the university faculty be authorized and invited for and during the period of three years commencing June 1st next to select delegates who shall represent it in the board of trustees. Said representatives shall not at any time exceed three in number. They and their successors shall be selected by ballot and for such terms, respectively, not extending beyond the period above mentioned, as shall be fixed

by the faculty. They shall have the right to meet with the board of trustees and the committee on general administration and shall possess the usual powers of trustees except the right to vote.

Early in June a special meeting of the university faculty was called and three professors were duly elected professorial trustees by ballot.

Upon the resignation of President A. W. Harris of Northwestern University the Board of Trustees decided that no president should be elected. The board appointed a committee to formulate and report a plan for the administering of the university work. The proposals presented contained the following provisions:

1. The trustees shall elect a president *ad interim* as general executive officer of the university with power of initiative within certain defined limits.

2. Recommendations on matters of educational policy, before going to the trustees for adoption, shall be laid before the university council, and the findings of the council shall be reported to the trustees.

The university council as at present constituted consists of the deans and directors of the various schools and an equal number, or nearly so, of members elected by the faculties. The deans recommended that the council be enlarged by doubling the number of elective members.

3. The deans and directors shall constitute an administrative board before which shall be laid any matter concerning two or more schools, not involving a question of policy. Matters affecting a single school shall be presented to the dean of that school before going to the trustees.

On April 10th the Board of Trustees of the University of Pennsylvania passed an amendment to its statutes making it possible for the alumni to select members for the board of trustees. In explanation it was stated by a member of the board "that the plan had been worked out to avoid the undesirability of an amendment to the charter granted to the university by the State, which states that the board shall fill two out of every three vacancies, the alumni being privileged to name candidates for the board in the third vacancy. 'It is an endeavor to retain in the board the actual power to elect its own members called for by the charter,' he said, 'but it expresses the board's willingness to confine its choice within the lines indicated.'"

A committee of the directors of Bryn Mawr, after consultation with the members of the faculty, reported the following recommendations regarding faculty participation in the government of the college:

1. Representation at meetings of the board of directors.

2. A committee elected by the faculty to make recommendations to the directors as to reappointments and terminations of appointments.

3. Provisions safeguarding the tenure of office of full professors after a certain number of years of service.

In conformity with these recommendations a definite plan outlining the duties and responsibilities of the president, the faculty, the academic council, the senate, and the officers of instruction was adopted.

**GENERAL EDUCATION BOARD.** The General Education Board issued its annual report for the fiscal year 1914-15 during the early part of 1916. The report shows that during its exist-



**JOHN A. WIDTSOE**  
University of Utah



**WALTER A. JESSUP**  
University of Iowa



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**GEORGE E. VINCENT**  
Rockefeller Foundation



**ERNEST MARTIN HOPKINS**  
Dartmouth College

**FOUR EDUCATORS PROMINENT IN 1916**





ence the board had appropriated directly \$16,862,147.71. Of this amount \$10,848,064.07 had been paid and the remainder was awaiting the fulfillment of the conditions under which the money had been appropriated to the various institutions. Universities and colleges had received appropriations amounting to \$11,672,460.16 and medical schools \$2,870,874.11. The resources of the board amounted to \$33,958,848.40. The gross income for 1915 was \$2,230,425.41. The board announced the following important appropriations during 1916:

Maryville College, \$75,000 toward an endowment fund of \$300,000; Western College for Women, \$100,000 toward an endowment fund of \$500,000; Milwaukee-Downer College for Women, \$100,000 toward an endowment fund of \$500,000; Washington University, \$250,000; Coker College, \$50,000; Colby College, \$125,000; Rockford College, \$75,000; Albion College, \$100,000; George Peabody College for Teachers, \$200,000; Hamline University, \$100,000.

The General Education Board in cooperation with the Rockefeller Foundation has appropriated \$2,000,000 to the University of Chicago for the establishment of a medical school. The university is required to appropriate at least the same amount. The new school will start with an initial endowment of almost \$8,000,000.

**NEW PRESIDENTS.** During 1916 the following college presidents were elected: David R. Kerr, Bellevue College; Howard C. Parmalee, Colorado State School of Mines; J. G. Crabbe, Colorado State Teachers College; Ernest Martin Hopkins, Dartmouth College; Weir C. Kelter, Grove City College; A. S. MacKenzie, Lenox College; Joseph M. Tilden, Lombard College; Mrs. Aurelia Henry Reinhardt, Mills College; U. G. Leazenby, Moores Hill College; U. V. W. Darlington, Morris-Harvey College; Thomas Franklin Kane, Olivet College; James W. Campbell, Simpson College; Mrs. Emilie McVea, Sweetbriar College for Women; Henry W. Elson, Thiel College; Walter A. Jessup, University of Iowa; Robert R. Moton (principal), Tuskegee Institute; J. A. Widtsoe, University of Utah; Robert E. Vinson, University of Texas; Chauncey P. Colgrove, Upper Iowa University; Wallace B. Fleming, West Virginia Wesleyan College; Ethelbert D. Warfield, Wilson College; J. Campbell White, College of Wooster.

During the year Dr. George L. Vincent, president of the University of Minnesota, resigned to accept the presidency of the Rockefeller Foundation, succeeding John D. Rockefeller, Jr. (See ROCKEFELLER PHILANTHROPIC BOARDS.)

**NEW SCHOOLS AND DEPARTMENTS.** The trustees of Columbia University provided for the establishment of a School of Business. The new school opened for instruction in September. The work within the school will consist of the theoretical basis of business and then as far as possible practical training will be given. The courses are at present designed for the college student who may choose to begin this work at the close of his sophomore year. One of the objects will be to prepare students thoroughly for the State examination for the certificate of certified public accountant. The National City Bank has offered scholarships to students recommended by this school and by others in order to equip graduates for work in the foreign departments of their institution. The school will re-

ceive graduate students who are candidates for higher degrees, students who have spent at least two years in some approved college, high school graduates who have completed through extension work the equivalent of the first two years of a college course, and students over 21 years of age who are actively engaged in business and who are qualified to undertake certain courses. The latter will be admitted as special students but not as candidates for a degree. It will be open to both men and women.

The Rockefeller Foundation has established an Institute of Hygiene and Public Health in connection with Johns Hopkins University. This institution will devote its attention to the problems of sanitation in cities and men will be trained to meet these problems. The announcement says: "The possibilities of usefulness of men so equipped have been found to be without limit in such efforts as those made by the American Red Cross in combating typhus in Serbia and by the International Health Board of the Rockefeller Foundation in its campaign against hookworm disease throughout the world.

"An institute of hygiene will become the central feature of the new school. Funds will be provided by the foundation for the erection of a suitable building in proximity to the hospital and the medical laboratories of Johns Hopkins University. In this building will be housed various laboratories and departments needed in such a school, such as those of sanitary chemistry, of physiology as applied to hygiene, of bacteriology and protozoology, of epidemiology and industrial hygiene, of vital statistics, a museum, and library. Additional facilities for instruction and research will be supplied by the schools of medicine, engineering, and social science, the hospital, and other departments of the university. Funds will be provided by the foundation for the maintenance and development of the school in accordance with plans which are being matured. No pains will be spared to develop an institution which, in its own field, will compare in usefulness with the Rockefeller Institute for Medical Research."

The Yale University Corporation voted to admit hereafter to their school of medicine a limited number of graduates of approved women's colleges.

The trustees of Columbia University also voted to admit women to their school of medicine. The date at which these may be admitted was left uncertain and was made contingent upon the college's ability to provide proper accommodations.

The first school to be devoted exclusively to the training of women to become dental hygienists was opened in New York City in connection with Hunter College and the Vanderbilt Dental Clinic of the College of Physicians and Surgeons, Columbia University. Under the Seeley Bill passed by the State Legislature the women will be graduated as dental hygienists. In addition to the practical instruction the students will devote a number of hours each week to work in the Vanderbilt Dental Clinic under supervision of specialists.

**PENSIONS FOR COLLEGE TEACHERS.** Under date of April 15, 1916, President Henry S. Pritchett of the Carnegie Foundation for the Advancement of Teaching issued "A Comprehensive Plan of Insurance and Annuities for College Teachers," President Pritchett had sub-

mitted the plan to the trustees of the foundation in November, 1915. They took no action concerning it except to express their approval of the president's efforts and to request that the report be presented to the associated institutions for their careful consideration and for suggestions. The new plan of insurance and annuities to take the place of the present pension system has called forth the most intense discussions on the part of college instructors and their institutions. The pension system which is at present in force provides the following benefits:

"1. An old-age pension available at age 65 or later and amounting usually to something like 60 per cent of the active pay of the teacher during the last five years of service. The rules are so framed that the teacher having very small pay receives a larger proportion. Thus the pension of a teacher whose salary is \$3000 is \$1900; the pension of the teacher whose salary for the last five years was \$1200 would be \$1000.

"2. A disability pension granted in cases of total disability, but only after 25 years of service as professor or 30 years of service as professor and instructor. This benefit amounts on the average to something like 40 per cent of the active pay.

"3. To the widows of teachers who have fulfilled either of these two conditions a pension is paid equivalent to one-half of that which the husband either was receiving or to which he was eligible."

Seventy-three institutions are associated in the enjoyment of these pension benefits. For the year 1914-15 there were 289 pensioned teachers, 95 pensioned widows, and the total annual payment was \$554,121.69. The report points out the fact that the pension system is "costing at the present time something over two-thirds of the income available to the foundation. According to actuarial computations its ultimate loan would be somewhere between one million and one million and three-quarters annually, according to the working of certain factors."

Among the faults of the present system are these: "It is available for only a limited number of universities and colleges. It restricts the migration of teachers from one institution to another. It has been considered part of the teacher's compensation, and a substitute for increased salary. It has resulted in the adoption by numerous institutions of a fixed age for retirement, which is unfortunate. It provides no protection for the teacher until he has been a professor for 25 years. A system of free pensions relieves both the teacher and his institution from an economic and moral responsibility. No pension system which is based, as practically all present systems are, upon future salaries, can calculate its future obligations or place them upon a contractual basis."

In place of the present system of pensions the president of the foundation "proposes a system of term insurance to the age of 65 or later, followed by an annuity for life, accumulated by contributions from the teacher and his institution. The foundation will contribute protection against disability, and guarantee pensions for widows, a good rate of interest on all accumulations, and all expenses of administration, using its entire income, as at present, for

the maintenance and development of the system. This plan may be extended to a larger number of institutions than the 73 now associated with the foundation, it will be conducted under the scrutiny of the State banking and insurance departments, the teachers will participate in its direction, and each contributor will have a contract guaranteeing definite benefits."

The board announced that "whatever plan is finally adopted will be devised with scrupulous regard to the privileges and expectations which have been created under existing rules."

A committee of the American Association of University Professors consisting of representatives from some 20 of the larger institutions has issued a report on this proposed plan. They ask that more definite information be secured and interpreted before any change is made and that the representatives of the American Association of University Professors be permitted to be present and to be heard at the meeting of the trustees. They also urge that "the consideration of this and other problems affecting the interests of university teachers would be facilitated and greater coöperation insured if the policy were adopted of electing university teachers to the board of trustees of the Carnegie Foundation from time to time as opportunity presents." Committees representing the various interested bodies have been invited by President Pritchett to coöperate with him in formulating plans that will be acceptable to all concerned.

**SURVEYS OF HIGHER EDUCATIONAL INSTITUTIONS. 1. Iowa.** In the early part of 1915 the Iowa State Board of Education requested the Hon. P. P. Claxton, United States Commissioner of Education, to make a survey of the institutions of higher learning in the State. More particularly the State board desired to have definite information regarding the matter of duplication of courses between its three institutions. Commissioner Claxton accepted the invitation and associated with himself the following persons: Dr. James R. Angell, University of Chicago; Dr. Kendrick C. Babcock, University of Illinois; Dr. Liberty H. Bailey, formerly director of the New York State College of Agriculture; Dr. Hollis Godfrey, president of Drexel Institute; Dr. Raymond M. Hughes, president of Miami University; and Dr. Samuel P. Capen, specialist in higher education of the Bureau of Education, who acted as chairman. The report of the Survey Commission was issued as Bulletin, 1916, No. 19, of the Bureau of Education. Chapter 3 deals with duplication and the principle of major lines. The summary of recommendations states:

- "1. The adoption of the principle of 'major and service lines of work' at the three State institutions.
- "2. The creation of a conference consisting of members of the faculties of the institutions and the State Board of Education to adjust questions of overlapping not automatically determined by the establishment of major lines for each institution.
- "3. The readjustment of the work in engineering at the State university and the State college, according to one of three methods:
  - (a) A horizontal division, assigning graduate work to one school and undergraduate work to the other.

- (b) The union of the two schools at one place.
- (c) A vertical division of work, assigning some branches of engineering to one institution and some to the other.
- "4. The discontinuance of the last two years in liberal arts at the Iowa State Teachers College, with suggestion of three-year non-degree courses for rural and grade teachers.
- "5. The enlargement of facilities for practice teaching at the State Teachers College.
- "6. The establishment of additional normal schools.
- "7. The addition of men to the faculty of the State Teachers College, to give half of their time to instruction and half as members of the staff of the State Superintendent of Public Instruction and the supervision of work in the normal-training high schools."

"By the principle of 'major and service lines,' each State educational institution has assigned to it certain 'major' fields which it may develop to the fullest extent. 'Service' lines are such subordinate subjects as are essential to the proper cultivation of a 'major' line. For example, agriculture at the Iowa State College of Agriculture and Mechanic Arts is a 'major' line, and English a 'service' line. On the other hand, English is described as a 'major' line at the State University and a 'service' line at the State College. On this principle no State would attempt to maintain two or more extensive and elaborate educational plants doing the same type of special work in the same field, and no institution would duplicate the work of another except to the extent that such work is necessary to the main task of the college."

2. *Washington.* The United States Commissioner of Education conducted an education survey of the State of Washington. The report, consisting of three sections, deals with higher education, public schools, and the State normal schools. The question of duplication of work in the higher institutions is considered in detail. The report states that "in the judgment of the committee the most important reform which may be wrought in the public education in Washington is the provision for the definite and permanent coördination of higher institutions." It suggests different methods for bringing about such coördination. As in the case of Iowa, the committee recommends the recognition of "major and service lines of work."

3. *North Dakota.* A survey commission has made recommendations to the Board of Regents of North Dakota relative to the readjustment of courses in the educational institutions of the State. The purpose is to prevent wasteful duplication. According to the recommendations the State University should be made an institution for professional and classical work and for the training of teachers for high schools, county superintendents, and supervisors. The agricultural college should deal with agriculture, vocational and industrial education, and also train teachers in these subjects. Farm engineering should be given a more important place in the college and a strong home economics department should be built up. The commission also proposes a division of work between the normal schools and recommends the establishment of a

fourth State normal school. The State School of Forestry should abandon forestry as its primary work and devote its efforts to building up a high-class school correlating with the State Agricultural College.

**TUITION CHARGES IN COLLEGES.** The 10th annual report of the president and of the treasurer of the Carnegie Foundation for the Advancement of Teaching presents a detailed statement of tuition charges for the past 10 years as reported by each of 100 representative institutions. The representative or medium fee has increased during the decade from about \$80 to about \$100. Twenty-nine of these institutions made no change in their charges during these 10 years. Fifteen other institutions report no charge for tuition. These, with one exception, are institutions supported by public funds. Three institutions reduced their charges during this period. There is a general tendency to include all incidental charges in the increased tuition. See also **ARCHITECTURE.**

**UNTERMAYER, LOUIS.** See **LITERATURE, ENGLISH AND AMERICAN, Poetry, American.**

**UPPER SENEGAL AND NIGER.** A colony of French West Africa (q.v.).

**URANUS.** See **ASTRONOMY.**

**URBAN, JOSEF.** See **DRAMA.**

**URUGUAY.** A South American republic bounded by Brazil and Argentina and bordering the Atlantic Ocean and the Rio de la Plata. The capital is Montevideo.

**AREA, POPULATION, ETC.** A planimetric calculation of the area of Uruguay shows that the 19 departments comprising the republic cover 186,925 square kilometers (68,996 square miles). Other published estimates of the area are 72,172 square miles, 72,153 square miles, and 72,210 square miles. The estimated population in 1915 was about 1,400,000; it seems not unlikely that this figure is somewhat excessive. The 1908 census returned a population of 1,042,686 (530,508 males, 512,178 females). Natives numbered 861,464, and foreigners 180,722; of the latter, 62,357 were Italians, 54,885 Spaniards, 27,789 Brazilians, and 18,600 Argentines. The population of the city of Montevideo, which was 291,465 at the 1908 census, was estimated at 378,446 at the end of 1915. Paysandú had, in 1908, 20,953 inhabitants; Salto, 19,788; Mercedes, 15,667.

In 1908, the population over five years of age numbered 873,231, of whom 347,491 were illiterate. Primary instruction is nominally compulsory. In 1914, public primary schools numbered 997, with an enrollment of 94,940; private schools, 219, with an enrollment of 20,006. There are several secondary, normal, and special schools, many religious seminaries, and at Montevideo an important university.

**INDUSTRIES AND COMMERCE.** Among Uruguay's industries the raising of live stock continues to hold first place. The estimated number of sheep is about 27,000,000, Uruguay thus having more sheep per square mile than any other country of the world. Cattle number upwards of 8,200,000. The number of horses returned by the live stock census of 1908 was 556,307. The wool clip constitutes one of the chief sources of wealth. Jerked beef is an important product, being exported to Brazil, Cuba, Porto Rico, etc. Much of the cattle supply is consumed by the frozen-beef and beef-extract establishments. Without minimizing the im-

portance of stock-farming, the government realizes that the essential requirement of permanent national prosperity is cultivation of the soil; hence, by the distribution of large quantities of seed, especially wheat, and in other ways, the government encourages agriculture. A falling off in cereal production was expected in the crop year 1916-17 on account of drought and locusts.

The table below shows the area, in hectares, of cereal crops, the production in metric quintals, and the yield per hectare in the crop year 1915-16:

	Hectares		Quintals		Qs.
	1914-15	1915-16	1914-15	1915-16	
Wheat ..	316,962	384,290	978,551	2,685,433	7.0
Corn ....	318,501	.....	2,891,082	.....	..
Oats ....	33,149	42,518	185,458	331,333	7.8
Barley ..	2,113	3,924	8,619	25,126	6.4
Linseed ..	40,923	17,863	149,388	99,217	5.6
Rye .....	76	30	250	184	6.1
Canary seed ..	.....	2,371	.....	13,350	5.6

Other products include wine, olives, and tobacco.

Imports of merchandise for consumption and exports of domestic produce have been reported as follows, in thousands of pesos (par value of peso, \$1.03424):

	1910	1911	1912	1913	1914	1915
Imports ..	40,814	44,798	49,380	48,717	37,235	34,780
Exports ..	41,023	44,537	53,042	62,637	58,234	73,291

The principal imports include provisions, cotton goods, manufactures of iron and steel, and building materials. The exports are almost wholly products of grazing and the meat industry. Thus, in 1915, out of a total export value of 73,290,671 pesos grazing and the meat industry were credited with 70,535,539 pesos; the more important classes were: meats and extracts, 30,333,922 pesos; wool, 20,089,178; hides and skins, 16,663,120; grease and tallow, 1,540,475; live animals, 1,088,874.

For the period September, 1915-February, 1916, the reported value of imports was 18,453,177 pesos, and of exports 30,170,926 pesos. Imports from and exports to the United States in this period were 4,653,910 and 5,963,547 pesos respectively; Argentina, 3,693,205 and 4,946,587; United Kingdom, 3,341,942 and 4,567,671; Brazil, 2,291,066 and 395,609; Spain, 1,211,925 and 1,791,670; Italy, 1,096,560 and 6,225,300; France, 964,639 and 5,151,708.

Shipping entered in 1914 totaled 12,092,482 tons; cleared, 12,028,456 tons.

COMMUNICATIONS. Uruguay has about 2240 miles of national roads and about 3100 miles of departmental roads. There are open to traffic about 1600 miles of railway (standard gauge), of which about five-eighths are under government guarantee. There has been train service between Montevideo and Porto Alegre, Brazil, since May, 1913.

FINANCE. The standard of value is gold. The monetary unit is the peso; its par value is \$1.03424. The budget for the fiscal year ending June 30, 1917, showed estimated revenue of 29,086,428 pesos and estimated expenditure of 29,406,445 pesos. The principal estimated receipts were as follows: customs duties, 12,500,000 pesos; property tax, 4,160,000; trade licenses,

1,600,000; tax on alcohol, spirits, wines, beer, tobacco, medicines, sugar, matches, live stock, and inheritance, 3,890,000; other taxes and stamps, 7,376,428. Larger estimated disbursements: for the public debt, 8,506,349 pesos; war and marine, 5,185,549; interior, 3,277,982; public instruction, 3,276,972; pensions, etc., 2,361,277; finance, 2,104,248; public works, 1,376,500. The foreign debt at the end of 1914 amounted to 141,144,140 pesos, consisting of the foreign consolidated debt of 121,482,175, the international debt of 2,135,000 pesos, and the internal debt of 17,526,465 pesos.

GOVERNMENT. The executive power is vested in a president, elected for four years by the General Assembly and ineligible for the next term. In case of the president's death or disability, the presiding officer of the Senate assumes the presidency. The president is assisted by a cabinet, appointed by himself and responsible to the House of Representatives. The legislative power is exercised by the General Assembly, or Congress, consisting of the Senate and the House of Representatives. Senators, 19 in number, one for each department, are elected by indirect vote for six years. Representatives, 90 in number, are elected by popular vote for three years. The franchise is held by male citizens over 20 years of age. The president in 1916 was Feliciano Viera, elected for the term ending March 1, 1919, in succession to José Batlle y Ordóñez.

UTAH. POPULATION. The estimated population of the State on Dec. 31, 1916, was 438,974. The population in 1910 was 373,351.

The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn .....	1916 13,000	429,000	\$493,000
	1915 13,000	442,000	354,000
Wheat ....	1916 326,000	6,900,000	10,488,000
	1915 320,000	8,225,000	7,074,000
Oats .....	1916 103,000	4,480,000	2,733,000
	1915 100,000	4,700,000	2,115,000
Potatoes ...	1916 20,000	3,600,000	4,680,000
	1915 20,000	2,500,000	1,575,000
Hay .....	1916 384,000	8,445,000	12,675,000
	1915 394,000	985,000	7,880,000
Rye .....	1916 12,000	144,000	144,000
	1915 13,000	202,000	181,000
Barley ....	1916 34,000	1,224,000	930,000
	1915 34,000	1,445,000	751,000

a Tons.

MANUFACTURES. The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments ..	749	1,109
Average number of wage earners .....	11,785	13,894
Capital invested .....	\$52,627,000	\$71,843,000
Wages .....	8,400,000	10,852,000
The value of materials used ..	41,266,000	62,233,000
The value of products .....	61,989,000	87,112,000

MINERAL PRODUCTION. The estimated coal production was 3,500,000 tons, which is the largest amount produced up to this time. This was an increase of 391,000 tons, or nearly 13

per cent. Except for short periods of car shortage the transportation facilities were ample for the first 10 months of 1916, but in November and December the car supply was reduced, and the production was somewhat curtailed. In the latter part of the year there was a considerable shortage of labor. The consumption of Utah coal by railroads increased, and the market on the Pacific Coast was extended largely by reason of the decrease in the water-borne fuel from Australia and Japan, and from the Atlantic coast of the United States. The activity of the smelter and metal mines was a large factor in causing the output of both coal and coke.

The value of gold, silver, copper, and zinc was \$55,105,070, an increase of \$17,953,477 compared with 1914. More than 59 per cent of the total value was for copper. The production of gold increased from \$3,265,347 in 1914 to \$3,609,109 in 1915, and silver increased from \$6,168,669 to \$6,242,795. Lead increased in value \$2,176,868 over 1914, while zinc showed an increase from \$815,453 in 1914 to \$3,012,238 in 1915. The value of the gold produced in 1915 was \$3,609,109, an increase of \$343,762 over 1914. The silver production was 12,313,205 ounces, valued at \$6,242,795, an increase of 1,158,289 ounces in quantity, and \$74,126 in value. The mined production of copper in 1915 was 187,671,188 pounds, valued at \$32,842,458, an increase of 35,637,186 pounds in quantity, and \$12,621,936 in value. The production of lead in 1915 was 199,957,437 pounds, or 28,644,300 pounds more than the output of 1914. The production of 1915 was the largest in the history of the State. The production of zinc in 1915 was 24,292,240 pounds, valued at \$3,012,238, compared with 15,989,267 pounds, valued at \$815,953 in 1914.

The mining in Utah established a new record in 1916. The output of gold, silver, copper, lead, and zinc had a total value of about \$97,000,000, according to the estimates of the United States Geological Survey. This is an increase of nearly 77 per cent or \$42,000,000 over the output of 1915. All the metals showed increases, and there were record outputs of copper, lead, and zinc. About 14,000,000 tons of ore were mined in 1916, compared with 10,451,445 tons in 1915. The gold output showed a slight increase from \$3,609,109 in 1915 to \$3,647,000 in 1916. The production of silver was 8 per cent greater in 1916 than in 1915, increasing from 12,313,205 ounces in 1915 to 13,357,000 ounces in 1916, amounting to an increase of over \$2,500,000. The copper production of the State in 1916 broke all records, increasing from 187,671,188 pounds in 1915 to 242,000,000 in 1916, an increase of 29 per cent in quantity, and over \$33,000 in value. The lead production also surpassed all former records, increasing from 199,957,437 pounds in 1915 to over 215,000,000 pounds in 1916, an increase of about 7 per cent in quantity, and over \$5,000,000 in value. The metallic zinc produced amounted to about 29,000,000 pounds, compared with 24,292,240 pounds in 1915. The increase in value was nearly \$1,000,000.

TRANSPORTATION. The railway mileage in 1915, the latest date for which statistics are available, was 2354. The railways having the longest mileage are the Denver and Rio Grande, 762; Central Pacific, 273; the Oregon Short Line,

242; San Pedro, Los Angeles, and Salt Lake, 498; Western Pacific, 121; Union Pacific, 75.

EDUCATION. The total school population of the State in 1916 was 128,344. The total enrollment was 108,369. The average daily attendance was 87,655. The female teachers numbered 2252, and the male teachers 917. The average yearly salary of male teachers was \$879, and of females \$656.

FINANCE. The latest available figures are for the fiscal year 1915. The receipts for that year amounted to \$4,358,004. The total disbursements amounted to \$4,889,893. There was a balance on Nov. 30, 1914, of \$1,366,482, and a balance on Nov. 30, 1915, of \$834,953. The principal items of expenditures are for the maintenance of State institutions, and for State roads. The bonded debt at the close of the year amounted to \$3,060,000.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions include State Industrial School, State Mental Hospital, State Prison, and the State School for the Deaf and Blind.

POLITICS AND GOVERNMENT. Utah furnished one of the chief surprises of the election. The State has for many years been strongly Republican, and in 1912 was one of two States, the other being Vermont, which cast its vote for Mr. Taft. In the election of 1916 the Democrats succeeded in defeating for United States Senator George Sutherland, who for many years had represented the State in the Senate. His opponent, William H. King, who was the candidate of the Democrats and Progressives, received 80,895 votes, compared with 56,862 cast for Sutherland. The Socialist candidate received 4497 votes. The Democrats also elected their candidate for Governor, Simon Bamberger, defeating M. L. Morris, Republican. Candidate Bamberger received 73,298 votes, Morris 59,522. The Democrats elected two congressmen and all the State officers. For President, Wilson received 84,025 votes, and Hughes 54,136. The overturn of the Republican party in the State was due chiefly to local conditions.

STATE OFFICERS. Governor, Simon Bamberger; Secretary of State, Harden Bennion; Attorney-General, Dan B. Shields; State Auditor, Joseph Ririe; State Treasurer, D. O. Larson; Superintendent of Public Instruction, E. G. Gowans.

JUDICIARY. Supreme Court: Chief Justice, J. E. Frick; Justices, W. M. McCarty and Corfman; Clerk, H. W. Griffith.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Democrats .....	13	42	55
Republicans .....	3	..	3
Progressives * .....	2	3	5
Socialists .....	0	1	1
Democratic majority..	8	38	46

\* Progressives were elected on a fusion ticket.

UTAH, UNIVERSITY OF. A co-educational State institution at Salt Lake City, Utah. It was founded in 1850. In the academic year 1915-16 there were 2835 students and the faculty numbered 125. During the year Dr. John Andreas Widsøe, formerly president of the Agricultural College of Utah, was appointed president of the university and Elbert D.

Thomas acting secretary. The percentage of the State tax allowed the university yields, with other sources of revenue, an average annual income of \$300,000. There are 40,012 bound volumes in the library, and 18,625 pamphlets. The library is the United States depository for Utah and also a depository of the Carnegie Institution of Washington.

**VACCINATION.** Another contribution to this question is that of Gins, who states that 500 men and 500 women were recently vaccinated at Berlin against smallpox before they were allowed to serve as nurses to the wounded. The reaction to the vaccination was recorded in each instance and classified according to four grades of intensity. Ten responded with a typical pustule, among those under 20; 16.9 per cent of those between 21 and 25; 19 per cent, 26 to 30; 30.4 per cent, 31 to 35; 62.7 per cent, 36 to 40; and over 40, about 65 per cent. These and other figures cited show that the German custom of vaccination of infants, and revaccination at the age of 12, Gins believes, protects till near the age of 40 a large per cent of those treated; while after 40 only about a third remain immune to smallpox. At the same time, the testimony presented indicates that when there is no reaction or only a faint response to the revaccination at 12, the subject runs no danger of ever having smallpox. The only really safe method is to revaccinate every three years, and also whenever an epidemic threatens.

**VACCINE THERAPY.** Asthma is the latest disease to be treated by this method and promising results have been reported by Rogers in a number of cases. His method is as follows: Cultures were made from freshly obtained sputum; sub-cultures were made from the fine pneumococcal and streptococcal-like colonies, a number of them being taken up so as to get as many strains as possible in the tubes used for making the vaccine. Occasionally the culture consisted so purely of fine colonies that the vaccine could be prepared from the primary culture, but this was exceptional. A solution of 5 c.c. of sterile salt was added to each tube, which was then heated to from 58 to 60 C. for one hour; one-half per cent of phenol was added, and after mixing well, the fluid was put up in doses of one-half and one c.c. The first dose was one-half c.c. which usually contained about 50,000,000 organisms. If only a little local reaction occurred, without fever, a dose of one c.c. was given after five days, and repeated weekly. Occasionally the dose was increased to one and one-half or two c.c., but as a rule this was unnecessary.

**WEIL'S DISEASE.** Ido and his co-workers have employed a serum from recovered patients and another serum obtained from actively immunized horses in the treatment of 35 patients suffering from Weil's disease. Among these there were seven deaths. The usual mortality in this disease in Japan is said to be between 30 to 48 per cent. The serum apparently destroys the spirochetes contained in the blood and promotes the development of antibodies. See **JAUNDICE**, **HEMORRHAGIC**.

**VACHELL**, HORACE ANNESLEY. See **LITERATURE**, **ENGLISH AND AMERICAN**, *Fiction*.

**VACUUM PUMPS.** See **PHYSICS**.

**VALPARAISO UNIVERSITY.** A co-educational non-sectarian institution at Valparaiso, Ind., founded in 1873. In the autumn of 1916

there were 5444 students and 220 faculty members. During the year a department of agriculture was established, headed by a dean of agriculture. Otherwise the faculty remained unchanged. For the use of the department of agriculture the university received a \$50,000 tract of farm land. From another source \$84,000 was received. In 1916 the university had in productive funds \$134,000. In tuition fees it received \$196,489. There were 17,000 volumes in the library. President, Henry B. Brown.

**VALUATION, RAILWAY.** See **RAILWAYS**.

**VANDERBILT UNIVERSITY.** A co-educational non-sectarian institution at Nashville, Tenn., founded in 1872. The total enrollment in all departments in the fall of 1916 was approximately 950 and the faculty numbered 145. During the year there was added to the endowment \$1,000,000, of which \$700,000 came from the Vanderbilt family and the General Education Board. Altogether the productive funds of the university amounted to \$2,600,000 and the income was \$275,000. There were 62,000 volumes in the library. Chancellor, James Hampton Kirkland.

**VAN HORN**, ROBERT THOMPSON. An American journalist and legislator, died in Kansas City, Mo., Jan. 3, 1916. Born at East Mahoning, Pa., in 1824, he became a printer's apprentice at 15. After some years in Pennsylvania, Indiana, Ohio, and New York, he went to Kansas City, where he purchased an interest in the *Weekly Enterprise* (1855). He changed the name to the *Journal*, of which for 40 years he was the editor. During the Civil War he served in the Union army as lieutenant-colonel, participating in the battle and siege of Lexington, Mo., the battle of Shiloh, and others. Although before the war he had been a Democrat, he turned Republican and is credited with having saved Kansas City to the Union. Afterward he served as mayor of that city, for three years as member of the State Senate, and for four terms as Representative in Congress.

**VAN VLECK OBSERVATORY.** See **ASTRONOMY**.

**VASSAR COLLEGE.** A non-sectarian institution for the education of women, at Poughkeepsie, N. Y. It was founded in 1861. In all departments in the fall of 1916 there were 1094 students registered and the faculty numbered 130. During the year the task of raising a \$1,000,000 endowment fund was completed. The productive funds of the institution amounted to \$1,406,900. In the library there were 92,000 catalogued books and pamphlets. In 1916 occurred the death of Dr. James M. Taylor (q.v.), president emeritus of the college. President, Henry Noble MacCracken. See also **HORTICULTURE**; **UNIVERSITIES AND COLLEGES**.

**VEGETABLES.** See **HORTICULTURE**.

**VEILLER**, BAYARD. See **DRAMA**.

**VENEREAL DISEASES.** See **PROSTITUTION**.

**VENEZUELA.** UNITED STATES OF. A republic of northern South America, situated between Colombia and British Guiana and extending from the coast south to Brazil. The capital is Caracas.

**AREA, POPULATION, ETC.** The estimated area is 1,020,400 square kilometers (393,976 square miles). Estimated population June 30, 1915, 2,816,484. There is reason to believe that this estimate is excessive. The following estimates of urban populations were published in 1916:

Caracas, 86,798; Valencia, 64,861; Maracaibo, 48,490; Barquisimeto, 32,776; Ciudad Bolivar, 21,595; San Cristóbal, 20,759. Births in 1914, 75,817; deaths, 51,697; marriages, 7492; immigrants, 10,810; emigrants, 10,742.

Primary instruction is free and nominally compulsory, but illiteracy is prevalent. The number of primary schools, public and private, is about 1600, with an enrollment of about 50,000 pupils. There is a considerable number of establishments for secondary, higher, and special instruction. The state religion is Roman Catholicism.

**PRODUCTION AND COMMERCE.** The crops of Venezuela include coffee, cacao, sugar-cane, corn, beans, cotton, etc. The area under coffee is about 200,000 acres. Coffee and cacao form the largest exports; the cotton output is consumed almost wholly in the mills of Valencia, Caracas, and Cumaná. The forests yield rubber, balata, copaiba, chicle, tonka beans, dividivi, and vanilla. Cattle raising is of considerable importance. There are large mineral resources; the principal minerals exploited are gold, asphalt, copper, iron, and petroleum.

Imports and exports in 1915 were valued at 69,793,970 and 121,266,459 bolivars respectively, as compared with 72,473,913 and 111,505,354 in 1914. Imports and exports valued in thousands of dollars (converted from bolivars at 19.3 cents) have been as follows:

	1910	1911	1912	1913	1914	1915
Imports	12,238	18,895	20,569	18,080	13,987	13,470
Exports	17,949	22,684	25,261	20,484	21,521	23,404

Leading imports in 1914 and 1915, in thousands of bolivars: cotton goods, 13,638 and 13,280; flour, 4531 and 5730; machinery, 2626 and 2638; drugs and medicines, 2457 and 3226; rice, 2064 and 3222; stearin, 1342 and 1819; agricultural implements and machinery, 1137 and 1698; lard, 689 and 1499; automobiles and accessories, 823 and 1269; wines, 1527 and 1251; bagging, 1254 and 1185. The table below shows the principal exports, in bolivars:

	1913	1914	1915
Coffee	83,919,796	63,958,085	60,868,909
Cacao	25,154,061	20,301,832	25,077,148
Cattle hides	7,456,887	6,947,888	8,536,875
Gold	1,795,295	2,628,434	6,633,244
Balata	10,532,993	3,619,812	4,089,763
Asphalt	2,959,356	1,498,785	1,703,510
Chicle	189,912	504,159	1,611,942
Frozen beef	68,331	303,132	1,402,352
Goat and kid skins	1,738,522	2,134,090	1,317,862
Beef cattle	3,119,193	1,423,014	1,299,450
Copper ore	1,525,000	1,319,900	1,094,000
Raw sugar	486,131	1,401,128	888,496
Cigarettes	3,250,985	163,012	861,858
Rubber	1,158,695	656,370	728,411

Trade by countries is shown below, in thousands of dollars:

	Imports		Exports	
	1914	1915	1914	1915
United States	6,015	7,943	9,379	13,170
United Kingdom	2,893	2,907	1,427	2,041
Netherlands	1,456	788	908	3,199
France	778	655	6,019	2,978
Spain	482	652	1,091	1,080
Italy	548	485	288	524
Germany	1,590	.....	1,930	.....

Total, including others 13,987 13,470 21,521 23,404

**COMMUNICATIONS.** The roads of Venezuela, in general, are in poor condition, but recently the government has shown considerable activity in road construction and improvement. There is a large amount of traffic by water; navigable rivers total some 11,000 miles. The railways extend from coastal points to the interior, but are not connected to form a system. There are 12 lines of railway. The total railway mileage of Venezuela was 539 miles, including the five miles of the Macuto and Coast Line Railway, an electric tramway. The Central Railway of Venezuela operates between Caracas and Yare, the extension of about five miles, from Santa Teresa to Yare, having been opened to traffic. The Bolivar Railway worked with regularity during 1915, and the new branch line to San Felipe was later opened to traffic as far as Marin, close to San Felipe. In the Maracaibo district three railways were operating in 1916, viz.: The Gran Ferrocarril de Tachira, about 72 miles in length, which runs from Encontrados on the river Catatumbo to Tachira, and from that town there is a good road to San Cristobal; the Gran Ferrocarril de La Ceiba, which starts from La Ceiba and runs for some 58 miles into the interior of the State of Trujillo; and the Santa Barbara Railway, which starts from Santa Barbara on the river Escalante, and runs about 50 miles into the state of Merida. Telegraphs, 211 offices, with 8780 kilometers (5455 miles) of line. Post offices, 296.

**FINANCE.** The standard of value is gold. The monetary unit is the bolivar, equivalent to the franc, its par value being 19.295 cents. The budget for the fiscal year ending June 30, 1916, balanced at 39,594,500 bolivars; for the following fiscal year, 44,180,000 bolivars. Principal estimated receipts in 1916-17: customs, 10,700,000 bolivars; reserve funds of the treasury, 5,960,000; salt monopoly, 5,500,000; tax on cigarettes, 5,500,000; tax on liquors, 4,000,000. The larger estimated disbursements were: for the public debt and the department of finance, 14,930,175 bolivars; war and marine, 9,640,346; interior, 9,236,643; public works, 3,175,400; fomento, 3,036,490; public instruction, 2,599,563. Public debt as reported for March 15, 1915: foreign, 101,267,650 bolivars; internal, 60,154,287; total, 161,421,937.

**GOVERNMENT.** Venezuela is a federal republic, consisting of 20 states, two territories, and a federal district; the states are autonomous. The present constitution bears date of June 13, 1914. The national executive power is vested in a president, elected by the Congress for seven years and assisted by a cabinet of seven members, whom he appoints and who are responsible to him. The legislative power is exercised by a congress of two houses, the Senate and the Chamber of Deputies. Senators, 40 in number (two for each state), are elected by the state legislatures for three years. Deputies are chosen by direct vote for three years, each state having one deputy for each 35,000 inhabitants and an additional one for an excess of 15,000.

On April 19, 1914, the Congress elected as provisional president Gen. V. Márquez Bustillos, to succeed Gen. Juan Vicente Gómez, who had been president since 1909. General Gómez became commander in chief of the army, but on May 3, 1915, was elected by the Congress to suc-

ceed Márquez Bustillos. The latter, however, continued as provisional president, while Gómez retained his post of commander in chief.

**VENIZELOS, ELEUTHERIOS.** A Greek statesman, who in September, 1916, set up a provisional government at Canea, Crete, later transferred to Saloniki. M. Venizelos was born in 1864 at Murniaes, Crete, of humble parentage. His given name means "liberty." At 23, having returned from law studies in Athens, he was elected to the Cretan Assembly and became leader of the Liberal party. Thereafter he was a conspicuous figure in the affairs of the island, especially in 1890, when he led the revolt against outside attempts to stabilize the government. In 1909 he was invited to Athens to become leader of a new party founded by the Military League, an organization working for constitutional reform. Gifted with great power and persuasiveness as a speaker, Venizelos within a year had been chosen Prime Minister. His influence became so great that a number of factions united to oppose his policies. It was he who brought about the participation of Greece in the first and second Balkan Wars, and after the opening of the European war he led the movement to range the country on the side of the Entente Allies. For his part in the political events of 1915-16 see the article GREECE, section on *History*, and the article WAR OF THE NATIONS in this and the preceding YEAR BOOK. Consult G. Keroflios, *Eleutherios Venizelos, His Life and Work* (New York, 1916); Crawford Price, *Venizelos and the War* (London, 1916).

**VERBUM NOBILE.** See MUSIC, *Opera*.

**VERDUN.** See WAR OF THE NATIONS.

**VERHAEREN, EMILE.** A Belgian poet, killed while boarding a train at Rouen, France, Nov. 27, 1916. He was born at Saint-Amand, near Antwerp, May 21, 1855. After attending a school at Ghent, he studied at the University of Louvain, and in 1881 was admitted to the bar at Brussels. His early radical journalistic enterprises, *La Semaine* and *Le Type*, were suppressed by the authorities, but presently he found surer footing with the reviews *La Jeune Belgique* and *L'Art Moderne*. To these he gave himself with enthusiasm, particularly as a champion of the impressionist painters who were then struggling for acceptance. Verhaeren at first allied himself with the French Parnassians, but he refused to be bound by the limitations of this school. With him in the "Young Belgium" group of writers who effected a literary renaissance were Maeterlinck and Georges Rodenbach.

Emile Verhaeren is essentially the national poet of Belgium, and especially of the Flemish Belgium that produced him. His verse is inspired largely by a passionate devotion, not to the nation as an entity, but to the land, the people, and the cities. The stark realism of his first work, *Les flamandes* (1883) brought most of the critics about his ears, but a few gave him encouragement. Three years later the young poet put out *Les moines*. This was followed by a trilogy that expressed the depths of morbidity and self-analyzed suffering reached by Verhaeren during a nervous breakdown. Written chiefly in England, it comprised *Les soirs* (1887), *Les débâcles* (1888), and *Les flambeaux noirs* (1890). Then came a gradual return to a vigorous interest in life and the world. Intense intellectualist that he was, he put behind him the struggle to solve the riddle of human des-

tiny. *Les apparus dans mes chemins* (1891), *Campagnes hallucinées* (1893), *Les villages ilusoires* (1894), and *Les villes tentaculaires* (1895) were the products of his convalescence. At this period he could regard cities only as "tentacled," like an octopus, ready to suck up the best life of the countryside and leave it desolate. Later, when he came to glory in the violent activity of commercial and industrial centres, he wrote *Les forces tumultueuses*, *La multiple splendeur*, and *Les rythmes*.

His affection for his homeland is perhaps best expressed in the series called *Toute la Flandre*, begun in 1904 with *Les tendresses premières* and continued with *La guirlande des dunes*, *Les héros*, *Les villes à pignons*, and *Les plaines*. Other volumes here to be noted include: *Les heures claires*, *Les visages de la vie*, *Les petites légendes*, *Les bords de la route*, and *Les blés mouvants*. Verhaeren wrote four dramas: *Les aubes* (1898), translated by Arthur Symons as *The Dawn*; *Le cloître* (1900), translated as *The Cloister*; *Philippe II* (1901); and *Hélène de Sparta* (1912). *Le cloître* was put on the stage in Brussels and Paris. Best known among his critical writings is his *Rembrandt* (1904). Since the beginning of the European war, betaking himself to France, Verhaeren had written *La Belgique sanglante* (translated as *Belgium's Agony*), had contributed to *The Book of Belgium's Gratitude*, and had prepared an appreciation of the English poet, Rupert Brooke. Much of his work, besides the books already noted, has been published in English. In 1915 Alma Strettel translated selected *Poems of Emile Verhaeren*, and in 1916 appeared *The Sunlit Hours* and *The Love Poems of Emile Verhaeren* (written to his wife before and after their marriage). His *Œuvres* were published in two series (1912 and 1914) by the *Mercur de France*. Consult numerous articles in the reviews during recent years and: H. B. Samuel, *Modernities* (New York, 1914); Stefan Zweig, *Emile Verhaeren* (London, 1914), with bibliography; Amy Lowell, *Six French Poets* (New York, 1915).

**VERMONT. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 364,322. The population in 1910 was 355,956.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

		Acreage	Prod. Bu.	Value
Corn	.....1916	45,000	1,935,000	\$2,128,000
	.....1915	47,000	2,256,000	1,895,000
Wheat	.....1916	1,000	25,000	41,000
	.....1915	1,000	30,000	32,000
Oats	.....1916	80,000	2,560,000	1,664,000
	.....1915	81,000	3,483,000	1,846,000
Potatoes	.....1916	23,000	2,576,000	3,581,000
	.....1915	24,000	2,592,000	2,100,000
Hay	.....1916	980,000	a 1,666,000	20,992,000
	.....1915	970,000	b 1,310,000	20,305,000
Tobacco	.....1916	100	b 160,000	30,000
	.....1915	100	130,000	14,000
Rye	.....1916	1,000	20,000	24,000
	.....1915	1,000	17,000	14,000
Barley	.....1916	15,000	412,000	412,000
	.....1915	12,000	420,000	315,000

a Tons. b Pounds.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the fol-



lowing comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments....	1,958	1,772
Average number of wage earners	83,788	82,704
Capital invested .....	\$73,470,000	\$79,847,000
Wages .....	17,272,000	18,617,000
The value of materials used...	34,823,000	42,706,000
The value of products .....	68,310,000	76,991,000

**TRANSPORTATION.** The total railway mileage of the State is about 1080. There has been practically no construction of roads in the last three years.

**EDUCATION.** The total school population of the State in 1916 was 75,977. The total enrollment was 65,050. The average daily attendance was 53,000. The male and female teachers numbered 3000. The average yearly salary of teachers was \$450.

**FINANCE.** The total receipts for the fiscal year 1916 amounted to \$3,960,725. There was a balance at the beginning of the year of \$107,848. The disbursements amounted to \$3,824,579, leaving a balance on hand on July 1, 1916, of \$243,994.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include the State Penitentiary at Windsor, the House of Correction at Rutland, Industrial School at Vergennes, State Asylum for the Insane at Waterbury, Soldiers' Home at Bennington, and the State Sanatorium at Pittsford. There were also 10 hospitals under the control of the State authorities. The State has no board of State charities.

**POLITICS AND GOVERNMENT.** The year 1916 was a momentous one for Vermont politically. The Legislature of 1915 passed a bill providing for the substitution of State-wide prohibition for the local-option, high-license law passed by the Legislature at its biennial session in 1902 and adopted by the people in the referendum of the following year. The new law was to take effect in 1917, if the voters in a referendum held in connection with the town meetings throughout the State in March, 1916, gave a majority vote in its favor. Otherwise, it was not to take effect until 1927, thus assuring the continuance of local option, even if a subsequent Legislature should fail to keep the implied faith and repeal the rejected bill. The Legislature at its session in 1915 also passed a bill providing for the adoption of the direct primary system in Vermont, to take effect in connection with the elections, State and national, in 1916, provided the voters at the annual town meetings in March gave the measure a majority vote. A spirited campaign was waged over the prohibition issue, but little attention was devoted to the direct nomination measure. A large vote was cast throughout the State in the respective town meetings in March. To the surprise of many voters local option had a majority of 13,489 over prohibition, the vote standing 32,142 for the existing law to 18,653 in favor of prohibition. Equally surprising was the adoption of the direct primary, the majority for the new system being 3537. Under the new primary law delegates to the national conventions are chosen by State conventions, instead of by State and district conventions as formerly. Candidates for United States Senators, Congressmen, State and county officers, and for both the State Senate and House of Representatives are nominated in an open primary, with the tickets

of all political parties printed on one ballot, there being separate ballots for United States Senator, State officers, and so on. Under the new primary law the candidates of a political party for State officers and for both branches of the Legislature hold a State convention at the call of the State chairman of that party's committee for the formulation of a State platform and the nomination of candidates for election as presidential electors.

The primary contest under the new law in September was one of the most spirited ever conducted in Vermont. The principal struggle was that over the Republican nomination for the United States Senate. The candidates were Senator Carroll S. Page, who desired to be his own successor, former Governor Allen M. Fletcher, and Governor Charles W. Gates. The only other contests of State-wide interest were those between Ex-Senator Roger W. Hulburd and Speaker John E. Weeks over the Republican nomination for Lieutenant-Governor, and between Secretary of Civil and Military Affairs Benjamin Gates and Thomas H. Cave over the Republican nomination for State auditor of accounts. Senator Page was renominated by a vote of over 23,000 to 8000 in round numbers for ex-Governor Fletcher and 6650 for Governor Gates. Hulburd was nominated for Lieutenant-Governor and Gates for Auditor.

At the presidential election in November the lead of Charles E. Hughes in the State was 17,542. The Republican candidate for the electoral college receiving the most votes had 40,250, the Democratic candidate 22,708, the Prohibition 709, and the Socialist 798, with 10 votes scattering.

The State election, formerly held in September, occurred under the amended State constitution in connection with the national election in November. Horace F. Graham, who was nominated in the September primaries without opposition, had a plurality of 25,738 over Dr. W. B. Mayo, the Democratic candidate, and the entire State Republican ticket had a similar margin. United States Senator Page defeated O. C. Miller, the Democratic candidate, by one of the largest majorities on record.

The election in Vermont in 1916 was significant for the entire disappearance of the Progressive party so far as a separate organization in the State is concerned.

By the purchase of an additional tract of 200 acres of land on the east side of Mount Mansfield, the Mansfield State Forest was increased in April to a total area of 5000 acres. It is now the largest State forest in Vermont, and excepting the Crawford Notch Forest in New Hampshire, the largest in New England.

In July the United States Supreme Court entered upon the consideration of a suit to determine the boundary line between Vermont and New Hampshire. This point has been in controversy since 1792. It became acute in the winter of 1916 when the New Hampshire boundary line commission reported to the Legislature fixing the boundary at high water mark on the west bank of the Connecticut River, which would give to New Hampshire much valuable property now paying taxes in Vermont. Vermont contends that the line should be at the western edge of the water, at its average and mean stage during the year.

**STATE OFFICERS.** Governor, Horace F. Gra-

ham; Lieutenant-Governor, Roger W. Hulburd; Secretary of State, Guy W. Bailey; Treasurer, Walter F. Scott; Auditor, Benjamin Gates; Adjutant-General, Lee S. Tillotson; Attorney-General, Herbert G. Barber; Commissioner of Education, Milo G. Hillegas; Commissioner of Agriculture, Elbert S. Brigham; Commissioners of Insurance, Guy W. Bailey and Walter F. Scott—all Republicans.

**JUDICIARY.** Supreme Court: Chief Justice, Loveland Munson; Associate Justices, John H. Watson, William H. Taylor, Seneca Haselton, George M. Powers; Clerk, L. C. Moody.

**STATE LEGISLATURE:**

	<i>Senate</i>	<i>* House</i>	<i>Joint Ballot</i>
Republicans .....	80	188	218
Democrats .....	..	40	40
Socialists .....	..	1	1
Republican majority..	80	147	177

\* House also has 17 additional members. Political affiliations not stated.

**VERMONT, UNIVERSITY OF.** A co-educational State institution at Burlington, Vt., founded in 1791. In 1865 the Vermont Agricultural College was incorporated with the university. In the fall of 1916 the total number of students was 659 and the faculty numbered 110. During the year Dr. James H. Worman was appointed professor of Spanish. The university had productive funds amounting to \$943,423 and drew an income from all sources of \$299,416. The library contained 94,353 bound volumes and 36,457 pamphlets. President, Guy Potter Benton.

**VERNER VON HEIDENSTAM, KARL GUSTAF.** A Swedish poet and novelist, awarded the Nobel prize in literature for 1916. He was born at Olshammar in 1859 and early studied painting at the Stockholm Academy and under Gérôme in Paris. Possessed of ample means, he traveled widely and his first published work (1888) was a collection of lyrical poems entitled *Vallfart och Vandringsdr* ('Pilgrimage and Years of Wandering'). This at once gained attention. In the same year appeared a volume of prose sketches, also on travel, entitled *Från Col di Tenda till Blocksberg. Hans Alienus* (1892), one of his most important works, is a romance describing a pilgrimage in search of beauty. The volumes entitled *Dikter* (1895) and *Nya Dikter* (1915) give him rank as the leading Swedish poet of his time. Although some of his verse is subjective and of mystical tendency, he is best known and liked for poems that voice a vigorous national spirit. Of his prose works, *Karolinerna* (1897-98), historical fiction relating to the time of Charles XII, was translated into English as *A King and His Campaigners*.

**VERSE.** See LITERATURE, ENGLISH AND AMERICAN; and articles on French, German, and other literatures.

**VETERINARY MEDICINE.** The fifty-second annual meeting of the American Veterinary Medical Association was held at Detroit, Mich., from August 21st to 25th, with an unusually large attendance. C. E. Cotton of Minneapolis was elected president and L. A. Merillat of Chicago, secretary. The association voted that all members on the honor roll, a roll established for long and faithful service, hereafter be known

as fellows of the association. A recommendation was adopted requiring a curriculum of 28 months involving four years, commencing with the session of 1916-17, at veterinary colleges on the accredited list of the association. After many years of effort the standing and scientific service of the veterinary medical profession was recognized by Congress in the National Defense Measure passed and approved by President Wilson, in which army veterinarians are given commissions with the rank of first and second lieutenant, captain, and major.

**FOOT-AND-MOUTH DISEASE.** The eradication of foot-and-mouth disease (see YEAR BOOK for 1915) was accomplished during the year after having appeared in 22 States and the District of Columbia. The last herd of cattle affected by the natural spread of the disease, in Christian County, Ill., was disposed of in February, 1916, and the only subsequent case was on a previously infected farm among some animals placed there to test the efficiency of the disinfection. Late in November Nebraska cattle received at the Kansas City stockyards were found to be suffering with sore mouths and a quarantine was established, but investigations demonstrated the infection to be a vesicular stomatitis. In the course of the year and a half of eradication work 77,240 cattle, 85,092 swine, 9767 sheep, 114 goats, and 9 deer were slaughtered. The expenditures by the Federal government amounted to \$4,600,000, while the total cost of eradication, including a similar sum by the States, was approximately \$9,000,000. This sum, large as it is, is trivial compared to the colossal damage which would have been inflicted if the disease had escaped control and become permanently established in the United States. To care for future outbreaks of this or other diseases which may seriously threaten the live stock industry, an appropriation of \$1,250,000 was made by Congress.

**TEXAS FEVER AND TICK ERADICATION.** The work of eradicating the cattle tick which transmits splenic or Texas fever proceeded more rapidly than ever before. During the fiscal year ended June 30, 1916, 31,158 square miles were released from quarantine, 9493 square miles were released on September 15th, and 15,117 square miles on December 11th. Up to the latter date 309,131 square miles in 13 States, including all of the infested area in California, Kentucky, Missouri, and Tennessee, or 43 per cent of the original tick-infested territory, had been released from quarantine.

**TUBERCULOSIS.** In his annual report for 1916 the Secretary of Agriculture called attention to the wide dissemination of tuberculosis of farm animals, which may be transmitted to man and is the source of annual losses in the United States estimated at \$25,000,000, and outlined plans for its eradication. Statistics indicated that over 10 per cent of the dairy cattle in the United States were affected with tuberculosis, and in the Federal meat inspection 2.5 per cent of the beef cattle and 9 per cent of the hogs inspected during the year were found to be so affected.

**HOG CHOLERA.** The work with this disease was continued by the Federal Bureau of Animal Industry, with an appropriation of \$360,000 for the fiscal year 1916-17. The field work consisted (1) of experiments to determine the practicability of eradicating hog cholera from se-

lected sections of the country, and (2) demonstration and educational work with the object of enlisting the aid of farmers. In 14 counties where field demonstrations were carried on there was an increase of 474,734 hogs in the number raised in 1915 over 1912 and a decrease of 121,628 in the number lost during the same period, or a total gain of 596,362 hogs, thus demonstrating what can be accomplished by the use of serum and sanitary measures. Results from the treatment of infected herds with antihog-cholera serum, either alone or in combination with hog cholera virus, lead to the conclusion that it should reduce the loss to 14 or 15 per cent, if applied promptly, instead of an average loss of 80 to 85 per cent without treatment. A new method of the Bureau for the economical production of a clear sterilized antihog-cholera serum consisted in the addition of a small amount of extract from ordinary white navy beans to the defibrinated hog cholera immune blood, resulting in a serum which could be heated to a point which would absolutely kill any germs of foot-and-mouth disease. Preliminary work for the commercial application of this method was begun by certain establishments. Experimental work showed it to be unwise to use hogs for serum production unless they had been inoculated simultaneously at least 60 days prior to hyperimmunization. It was determined that the diluted virus possessed no advantages over the undiluted virus. Studies of the persistence of hog cholera virus in simultaneously treated pigs indicated that it persisted in the blood for a period of approximately two weeks, and that where sufficient serum was given to prevent the development of symptoms of the disease following inoculation the virus disappeared from the blood before the 28th day. Treatment after the appearance of clinical symptoms of cholera with larger doses of the serum than usually employed had noticeable effect on the course of the disease. Investigations by Healy and Gott in Kentucky indicated that the virus of hog cholera on incubation with hyperimmune blood for 48 hours at 37° C. was so modified that when injected it would no longer render normal hogs sick but would protect them when later exposed to hog cholera.

**CONTAGIOUS ABORTION.** An appropriation of \$50,000 was made by Congress for the development of means for controlling contagious abortion, a disease which had reached such proportions as to threaten seriously the cattle-raising industry, its exceedingly rapid spread among range animals being an outstanding feature. The use of the agglutination test had been found by Schroeder to be a very reliable and inexpensive means of detecting infected animals. Since cows that have never aborted and regularly produce seemingly normal calves may be chronic carriers and disseminators of abortion bacilli, this test should be applied to every new animal purchased before it is permitted to come into contact with the uninfected herd.

**HEMORRHAGIC SEPTICEMIA OR SHIPPING FEVER OF CATTLE.** This disease of cattle recognized in the United States for the past 20 years was the source of heavy losses, numerous outbreaks having occurred during the fall of 1915 and the spring of 1916 in the Central and Northwestern States.

**GLANDERS.** During the course of an outbreak of glanders at Newport News, Va., in which

about 300 samples of blood serum were tested by the complement-fixation test, post-mortem examinations substantiated the results of the serum test in practically every case. The results obtained so far from work with mules were encouraging and indicated that the conglutination test was not only specific but of particular value in the testing of sera possessing anticomplementary or nonspecific fixing bodies.

**ANTHRAX.** Further experiments confirmed the efficacy of the combined serum and spore treatment of anthrax, as described by Eichhorn in a bulletin of the Federal Department of Agriculture. Reports upon the use during the year of approximately 7500 doses of anthrax serum and spore vaccine for the simultaneous method of immunization against the disease in the control of outbreaks in various parts of the country fully established the value of this method of immunization. A considerable quantity of the serum was supplied for the treatment of anthrax in man and animals and proved a valuable remedy.

**BLACKLEG OR SYMPTOMATIC ANTHRAX.** A blackleg serum prepared in Kansas was used on some 25,000 head of calves in Kansas with practically no loss. This serum, a sterile filtered product of animals highly immunized against blackleg by *Bacillus chauveauxi*, was found not only to protect animals against the disease but often to check it if given in its early stages. As the serum will protect animals for only 10 days to two weeks it must be followed in three days with a very strong dose of vaccine in order to insure a long period of immunity, and when thus produced the immunity lasts for more than 12 months.

**SWAMP FEVER.** This disease was increasing in economic importance, having gained a foothold in New York State, where it was first recognized in 1914.

**DOURINE.** This disease was found to be much more widely distributed among horses in some States than had been supposed. Good results were accomplished in eradication work in Montana, Wyoming, North and South Dakota, Nebraska, and Arizona. The complement-fixation test was made of blood serum from 45,100 animals, of which 1400 or 3.1 per cent gave positive reactions. The microscopic agglutination test for the diagnosis of dourine was devised during the year. This test supplements the complement-fixation test and is of particular value in certain cases since it greatly facilitates the rapid diagnosis of large numbers of samples.

**SCABIES ERADICATION.** As a result of work by the Federal Department of Agriculture sheep scabies was fast being eliminated from the sheep of the Western States. In California 43,243 square miles were released from quarantine during the fiscal year 1916. In the eradication work with cattle scabies 12,691 square miles in Texas were released from quarantine during the fiscal year.

**WHITE DIARRHEA OF CHICKS.** In the campaign against bacillary white diarrhea of chicks in Connecticut 14,617 fowls in 107 flocks were given the microscopic agglutination test and 9.85 per cent of the fowls found to be infected.

**RABIES.** Work was carried on under appropriations made by Congress for the suppression of rabies among wild animals in the infested area of southeastern Oregon, northeastern California, northern Nevada, and southwestern

Idaho. The loss of live stock from this source has been very heavy, a single rabid coyote having caused the loss of 27 steers in one feed lot.

**MISCELLANEOUS.** Feeding experiments at the Mississippi Experiment Station showed *Claviceps paspali* on Paspalum grass to be poisonous for cattle. Investigations by Yoshida in Formosa resulted in the discovery that two fresh water crabs are intermediate hosts of the lung distome (*Paragonimus westermanni*). Meyer, Traum, and Roadhouse in California have found *Bacillus enteritidis* to be responsible for certain forms of infectious diarrhea in calves. Experiments by Lamson in Connecticut have shown serious losses of chickens to be caused through feeding upon rose chafers, which contain a neurotoxin that has a direct effect upon the heart. Gutberlet has furnished evidence that the intermediate or cysticeroid stage of the tapeworm *Choanotania infundibuliformis* of chickens occurs in the common house fly.

**NECROLOGY.** Among the veterinarians who died during the year D. Arthur Hughes, Ph.D., D.V.M., whose death took place in Chicago, February 14th, at the age of 46 years, was perhaps the best known. Dr. Hughes was a professor at the Chicago Veterinary College and inspector of food supplies for the quartermaster corps of the United States army at Chicago. He was a voluminous writer, having frequently contributed to American and English veterinary journals.

**Bibliography.** Among the works published during the year were the following: E. T. Baker, *Sheep Diseases* (Chicago); R. E. Buchanan and C. Murray, *Veterinary Bacteriology* (2nd ed. rev., Philadelphia); W. Chenevard, *Maladies des Volailles* (Paris); R. Edelmann, trans. by J. R. Mohler and A. Eichhorn, *Textbook of Meat Hygiene* (3rd rev. ed., Philadelphia, 1916); H. B. Hemenway, *Essentials of Veterinary Law* (Chicago); E. W. Hoare, *Veterinary Therapeutics—A Guide to the Treatment of Disease in the Domestic Animals* (3rd ed. rev., Chicago); F. Hutyrá and J. Marek, *Special Pathology and Therapeutics of Domestic Animals* (2nd rev. and enl. ed., Chicago); J. V. Lacroix, *A New and Complete Work on Lameness of the Horse* (Chicago); L. A. Merillat, *The Principles of Veterinary Surgery* (2nd ed., rev. and enl., Chicago, 1915); G. Müller and A. Glass, *Diseases of the Dog and Their Treatment* (4th ed., rev. and enl., Chicago); R. Pearl, F. M. Surface, and Maynie R. Curtis, *Diseases of Poultry: Their Etiology, Diagnosis, Treatment, and Prevention* (New York, 1915); T. B. Rogers, *Veterinary Handbook and Visiting List* (Philadelphia and London); M. R. Steffen, *Special Cattle Therapy* (Chicago, 1915); H. Zinsser, J. G. Hopkins, and R. Ottenberg, *A Laboratory Course in Serum Study* (New York).

**VICKERS-MAXIM MACHINE GUN.** See MILITARY PROGRESS, *United States*.

**VICTORIA.** A state of the Commonwealth of Australia, lying south of New South Wales and east of South Australia. After Tasmania it is the smallest of the Australian states, the area being 87,894 square miles, which is about 3 per cent of the area of the Commonwealth. The population according to the census of 1911 was 1,315,551 (655,591 males, 659,960 females), exclusive of full-blooded aborigines. The increase per cent in the decade 1901-11 was 9.53, in 1891-1901 5.37, in 1881-91 32.30. At the end

of 1914 the number of inhabitants was estimated at 1,430,667, of which the town population was 893,700. The capital of Victoria is Melbourne, which is also the temporary capital of the Commonwealth; its population at the 1911 census was 103,598; including suburbs, 588,971; estimate of Dec. 31, 1914, 674,000.

The executive authority rests with a governor, who is appointed by the crown and is assisted by a responsible ministry of 12 members. The Parliament consists of two chambers, the Legislative Council (34 members) and the Legislative Assembly (65 members); members of the Council are elected for six years, and those of the Assembly for the duration of Parliament, which is limited to three years. The franchise was extended to women by an act of 1908. The governor in 1916 was Sir Arthur Lyulph Stanley, K.C.M.G., who was appointed in January, 1914; premier and treasurer, Sir Alexander James Peacock, K.C.M.G. See AUSTRALIA.

**VICTORIA, QUEEN.** See LITERATURE, ENGLISH AND AMERICAN, *History, etc.*, English.

**VILLA, FRANCISCO.** See MEXICO, *History*.

**VILLAS.** See ARCHITECTURE.

**VILLA-URBUTIA, MARQUÉS DE.** See SPANISH LITERATURE.

**VINCENT, FRANK.** An American explorer and author, died June 19, 1916, at Woodstock, N. Y. His home was in New York. He was born in Brooklyn, N. Y., in 1857, was educated at Yale, and spent most of his life in travel in various parts of the world. He became most famous for his explorations in India, and for his book called *The Land of the White Elephant* (1874), telling of his journey to Mandalay, which he reached a decade before the British occupation, and describing among other things the ruins of Cambodia in Farther India. The King of Siam and the heads of eight other governments decorated him for his discoveries, and Yale gave him an honorary degree of A.M. Among other lands that Mr. Vincent visited were Indo-China, Lapland, Brazil, and the Congo Free State. Alone he traveled across Lapland, and for 1000 miles into Brazil, where he discovered the double cataract of the River Iguassu, which he named Daly Falls, in honor of the president of the American Geographical Society. Besides the book already mentioned, Mr. Vincent published *Through and Through the Tropics; Norsk, Lapp, and Finn; Around and About South America; In and Out of Central America; The Lady of Cawnpore; and Actual Africa*.

**VINCENT, GEORGE EDGAR.** See ROCKEFELLER PHILANTHROPIC BOARDS, *Rockefeller Foundation*.

**VIRGINIA.** POPULATION. The estimated population of the State on Dec. 31, 1916, was 2,202,522. The population in 1910 was 2,061,612.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

	Acreage	Prod. Bu.	Value
Corn . . . . . 1916	2,140,000	60,990,000	\$56,721,000
1915	2,125,000	60,562,000	42,999,000
Wheat . . . . . 1916	1,800,000	16,250,000	26,812,000
1915	1,230,000	16,974,000	18,382,000
Oats . . . . . 1916	250,000	5,750,000	3,622,000
1915	225,000	5,625,000	3,094,000
Potatoes . . . . . 1916	125,000	16,250,000	22,262,000
1915	140,000	17,500,000	10,675,000

	Acreage	Prod. Bu.	Value
Hay .....	1916 790,000	a 1,066,000	\$15,990,000
	1915 700,000	945,000	14,886,000
Tobacco ...	1916 190,000	b 129,200	18,863,000
	1915 192,500	144,375	13,571,000
Cotton .....	1916 44,000	c 29,000	2,682,000
	1915 86,000	16,000	870,000
Rye .....	1916 75,000	938,000	1,004,000
	1915 70,000	1,015,000	944,000
Barley ...	1916 13,000	358,000	804,000
	1915 12,000	348,000	261,000

a Tons. b Pounds. c Bales.

See also AGRICULTURAL EDUCATION.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned, in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments..	5,685	5,508
Average number of wage earners .....	105,676	102,820
Capital invested .....	\$216,892,000	\$261,501,000
Wages .....	88,154,000	44,874,000
The value of materials used.	125,583,000	155,319,000
The value of products.....	219,794,000	264,089,000

**MINERAL PRODUCTION.** The estimated output of coal in the State in 1916 was 9,150,000 net tons, an increase compared with 1915 of 1,727,000 tons, or 21 per cent. The quantity of coal made into coke is estimated to have increased nearly 600,000, and shipments to have increased more than 1,000,000 tons. The demand for coal and coke from the Virginia fields was strong throughout the year. In the last six months the demand was considerably in excess of the supply. There was a scarcity of labor practically throughout the year, and the supply of cars was inadequate from June to the end of the year.

The production of iron in the State in 1915 was 348,042 gross tons, compared with 378,520 tons in 1914. The value of the ore shipped from the mines in 1915 was \$696,920 compared with a value in 1914 of \$719,415.

The production of coal in the State in 1915 was 8,122,596 short tons, valued at \$7,952,934. This was an increase over the production of 1914 of 163,061 tons. The number of men employed decreased from 9003 in 1914 to 8059 in 1915.

**TRANSPORTATION.** The total railway mileage of the State in 1916 was 4705. The roads having the longest mileage are the Norfolk and Western, 1176; Southern Railway Company, 884; the Chesapeake and Ohio Railway Company, 783; the Virginian Railway Company, 333.

**EDUCATION.** The total school population of the State in 1916 was 658,925. The total enrollment was 474,210. The average daily attendance was 317,140. Teachers male and female numbered 12,507. The average yearly salary of teachers was \$332.19. The most striking feature of the legislation affecting education in Virginia has been the adoption of laws designed to increase the efficiency of rural schools, particularly the one and two room schools, and laws prescribing educational qualifications for division superintendents. The laws adopted by the Legislature of 1916 also aimed to extend the usefulness of the agricultural high schools and offer much more liberal terms to school districts which wish to borrow from the State's Literary Fund, for the erection of school buildings.

**FINANCE.** The latest statistics available for finance are for the fiscal year ending October, 1914. There was on Oct. 1, 1913, a balance in the treasury of \$482,823. The receipts from all sources amounted to \$7,797,532, and the disbursements to \$7,645,357, leaving a balance on hand on Oct. 1, 1914, of \$835,417.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include the Virginia Penitentiary at Richmond, State Farm at Lassister Post Office, Central State Hospital at Petersburg, Southwestern State Hospital at Marion, Western State Hospital at Staunton, the Virginia State Epileptic Colony and the Virginia Colony for the Feeble-Minded at Madison Heights, the Catawba Sanatorium, the Virginia School for the Deaf and Blind at Catawba, and the Virginia State School for the Colored Deaf and Blind at Newport News.

A number of other institutions are supported by the State, but are not under the control of the State Board of Charities. This board also has charge of the almshouses and jails in the cities and counties.

**POLITICS AND GOVERNMENT.** Virginia in the year 1916 had no political campaign of note, save that in one congressional district, the ninth, there was a rather warm contest between the Democrats and the Republicans, the latter retaining the Congressman. Except for the election of one United States Senator, who had no opposition, and the Congressmen, no other officers were chosen. All State officers are chosen in "off years," for a term of four years, following the presidential elections. In 1916 President Wilson increased his vote over that of four years ago by some 13,000 and his majority by approximately the same figure. The Republican presidential vote also showed an increase. The total vote for all presidential candidates was: Wilson, 102,824; Hughes, 49,356; Hanly, 1062; Benson, 683; Reimer, 67. Total, 154,012. United States Senator Claude Augustus Swanson, of Pittsylvania, ran ahead of the national ticket of the Democrats, many Republicans voting for him, his total vote being 133,056, approximately 30,000 ahead of the nominee for President. There were no issues, save that the Democrats endorsed and approved the administration of President Wilson in every respect, and the increased vote for him reflects that sentiment. He was given unanimous and hearty endorsement at the Roanoke convention of June 1st.

For Congress, all the old members, save one—Judge Thomas W. Harrison of Winchester succeeding Judge James Hay, now of the Court of Claims—were returned by the following vote: First district—Jones (D.), 9772; Butzner (R.), 2823. Second—Holland (D.), 10,123; Way (R.), 1939. Third—Montague (D.), 10,967; Maxey (Socialist), 751. Fourth—Watson (D.), 8119; Alfred (R.), 424. Fifth—Saunders (D.), 10,614; Davis (R.), 7601. Sixth—Glass (D.), 9119; Wilson (R.), 2920. Seventh—Harrison (D.), 10,052; Paul (R.), 6064. Eighth—Carlin (D.), 9168; Crupper (R.), 3450. Ninth—Slemp (R.), 17,848; Trinkle (D.), 16,460. Tenth—Flood (D.), 11,282; Nair (R.), 4583. There were several candidates for Congress on various divisions of the Socialist party, but the vote of none of them would have changed the result in the least in any case, some of them receiving so few votes as not to warrant consideration. However, they had candidates in

each district in the State. Hopewell, the newest city in the State, with a population of more than 25,000, cast just 28 votes for President of the United States, this being due to the fact that no person who had not lived for a year in the city limits could vote, while those who had not been in the State for two years could not vote, and the city was only developed in the last 18 months, with a population that is shifting at all times.

All of the candidates on the Democratic ticket were the result of primary elections, save that in the ninth a convention was held. On the other hand, all the Republicans were named by conventions. Under the laws of the State parties can make nominations by any plan that they may prefer, but in primaries the general election laws obtain. All candidates, whether successful or not, must file complete statements of all expenses, regardless of manner of nomination.

LEGISLATION. The Legislature met in 1916, and enacted many important measures. A record of these follow:

Court clerks were authorized to appoint as deputies women over 21. Provision was made for a public defender in cities of over 50,000, appointed for two years and removal to be made by the judge appointing him. Laws relating to procedure of criminal trials were amended. Trial judges were authorized to substitute road work for jail sentence in misdemeanor cases. The bureau of markets was established in the Department of Agriculture. Discrimination against persons wearing the United States or State militia or naval uniform was made a misdemeanor. The practice of optometry, and medicine and surgery were regulated. It was also made a misdemeanor for physicians to divide fees. The food laws were amended in important details. It was made a misdemeanor for any one using intoxicants to operate an engine, car, automobile, or train. It is declared that the father and mother are equally entitled to the custody, services, and earnings of legitimate children. The uniform land registration or Torrens system law was adopted, but does not apply to certain cities and counties until approved on referendum.

A prohibition law went into effect on March 1st. Although a large part of the State had previously voted dry in local option elections, the new law closed more than 800 saloons, chiefly in Richmond, Norfolk, Newport News, Lynchburg, Petersburg, Roanoke, and Bristol. The law is one of the most drastic ever passed by the State Legislature. No beverage showing a trace of alcohol, except cider, is allowed; and possession of more than one gallon of whiskey, one gallon of wine, and three gallons of beer are regarded as prima facie evidence of intent to violate the law. Together with the prohibition measure and to insure its enforcement the Legislature passed a bill which provided that ouster proceedings may be brought against State or municipal authorities who show a laxity in putting it or any other measure into effect. In addition a commissioner is provided to see that the law is enforced.

The House of Delegates in April defeated a bill already passed by the Senate providing for the establishment of a coordinate college for women at the University of Virginia. The vote was 46 to 48.

A new law went into effect during the year

under the provisions of which public officials may be removed for failure to enforce any statute.

STATE OFFICERS. Governor, Henry C. Stuart; Lieutenant-Governor, J. T. Ellyson; Secretary of Commonwealth, B. O. James; Auditor, C. Lee Moore; Treasurer, A. W. Harman; Superintendent of Instruction, R. C. Stearnes; Attorney-General, J. Garland Pollard; Adjutant-General, W. W. Sale; Commissioner of Agriculture, George W. Koiner; Commissioner of Insurance, Joseph Button—all Democrats.

JUDICIARY. Supreme Court of Appeals: President, George M. Harrison; Justices, S. G. Whittle, Joseph L. Kelly, Frederick W. Sims, Robert R. Prentis; Clerk, H. Stewart Jones.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Democrats .....	36	88	124
Republicans .....	4	12	16
Democratic majority..	32	76	108

VIRGINIA, UNIVERSITY OF. A State institution for the education of men at University, Va. It was founded in 1819. The total student enrollment in the fall of 1916 was 1087. The faculty numbered 79. In gifts, \$250,000 was received. The productive funds of the institution amounted to \$2,215,859, and the total income to \$374,256. In the library were 90,000 volumes. President, Edwin Anderson Alderman.

VIRGIN ISLANDS. A presidency of the Leeward Islands (q.v.).

VITALISM. See ZOOLOGY, *Vitalism*.

VITAL STATISTICS. INFANT MORTALITY. A statistical bulletin and chart, recently issued by the New York Milk Committee, gives the infant mortality rate in 144 cities in the United States. According to these figures only four of these cities were giving adequate attention to this important subject. These cities, with their infant death rates, are La Crosse, Wis. (30.6); Ogden, Utah (39.8); Omaha (47.1); and East Orange, N. J. (48.8). The highest infant death rate in the whole series is that of Passaic, N. J. (193.5), but in this "bad eminence" Passaic is closely rivaled by Montgomery, Ala. (185.1), Nashville, Tenn. (182.3), and Perth Amboy, N. J. (176.7). No city with a population of 200,000 or over has an infant death rate as large as those just mentioned, but not one of them has the permissible rate of 50, and few even approach this limit. The lowest rates among cities of this class are those of Seattle, Wash. (53.1), and Portland, Ore. (57.7). The highest are those of Jersey City, N. J. (132.9), and Indianapolis, Ind. (131.6). To quote: "Of cities with a population of 100,000 or more, a baby born in Omaha was found to have four times as good a chance to live to celebrate the first anniversary of its birth as a baby born in Nashville, Tenn., or Fall River, Mass. In the cities under 100,000 and over 50,000 population, a Salt Lake City baby has over three times the chance of surviving the first year of life that a Passaic, N. J., or Holyoke, Mass., baby has; while in cities between 25,000 and 50,000 population a La Crosse, Wis., baby has an advantage more than six to one over a Montgomery, Ala., or Perth Amboy, N. J., baby."

J. W. Nicon, in a paper read before the Royal

Statistical Society, London, discusses the effect of war on national vital statistics. He analyzed the statistics of births, deaths, and marriages in France and Prussia for the period of 1868-73 and showed that both countries experienced a rise in the death rate in 1870 and 1871—the increase in the number of “civil” deaths being greater than the number of “military” deaths. This was especially marked in the case of France, the number of “civil” deaths being 437,000 more in 1870-71 than in 1868-69, when the number of “military” deaths was at the most 150,000. The rise in the death rate was felt at all ages and shared equally by the two sexes. Not only the two belligerents but the three surrounding neutral states of Belgium, Holland, and Switzerland all showed a period of maximum mortality in 1871. England and Wales remained unaffected. After the war, rapid recoveries set in in all countries except Prussia, the death rate in France falling in 1872 to 22 per thousand, the lowest on record. A serious fall in fertility was experienced by France and Prussia in 1871, and the three neighboring neutrals similarly suffered a reduction in their birth rates. There was a sudden decrease in marriage rates in France and Prussia in 1870; but in the year 1872 in both countries the marriage rate reached the highest on record. During the present war, England, France, and Germany are experiencing a serious fall in the birth rate. The death rate has not been seriously affected in England, the slight rise in 1915 being due to some extent to the bad winter and to an epidemic of measles. On the marriage rate the effect has been the reverse of that in the Franco-Prussian War, a large rise having taken place in 1916. The theory advanced early in the war that it was having the effect of increasing the proportion of male births—an old superstition—was found to be groundless. The serious effect which the war has on the vital statistics of the nation is shown by the fact that the “natural increase” of population in 1913 was 377,000. In 1915 it fell to 252,000, exclusive of deaths of soldiers abroad.

A report of the registrar-general on vital statistics for England and Wales shows that the population was in the year 1914 estimated at 36,960,984; males numbered 17,877,052, and females 19,083,632. There were 294,401 marriages during the year. The birth rate was 23.8 per thousand, the lowest on record. The total number of deaths registered in the year was 516,742. This gives a rate of 14 per thousand population, 0.2 higher than in the preceding year, but 1.4 below the average for the 10 preceding years. Of the total number of deaths registered, 91,971 or 17.8 per cent were those of infants under one year of age. This corresponds to an infant mortality rate of 105 per thousand births, being the lowest on record, excepting an equal rate in 1910 and a lower one in 1912. The provisional infant mortality rate for 1915 shows an increase to 110 per thousand births—no doubt because of the disturbing influence of the war.

A community having an infant mortality rate of zero, for a period of 10 years, has just been discovered. This is Villiers-le-Duc, a little commune in the south of France. Between 1893 and 1903 no child under one year of age died. During the preceding 90 years the rate has been from 20 to 30 per hundred, except from

1854 to 1863, when it fell to 15 per hundred. This fall was attributed to a mayor who was interested in public health and particularly in children. Similarly, the zero rate for 1893 to 1903 is attributed to measures taken by another mayor, son of the former official, who was also interested in saving the lives of babies. The measures introduced included the care of the mother before childbirth, assistance being given when necessary, strict regulation of midwives and their procedures, and supervision of the mother and nursing. Other regulations provide for the sterilization of milk and the welfare of infants placed out to nurse. Dr. Moore, of Huddersfield, England, who writes of this community, does not give the population or other vital statistics relative thereto, so that it is impossible to estimate the value of his report.

**CONTAGIOUS DISEASES.** The following statistics as to contagious diseases throughout the world are compiled from the United States Public Health Reports. While in many instances incomplete and misleading, they are the best obtainable:

*Smallpox.* Algeria, 1 case; Argentina, 97 cases; Austria-Hungary, 1539 cases, 37 deaths; Brazil, 602 cases, 145 deaths; British East Africa, 8 cases, 6 deaths; Canada, 34 cases; Canary Islands, “epidemic”; Ceylon, 14 cases, 2 deaths; China, 408 cases, 238 deaths; Cuba, 2 cases; Egypt, 233 cases, 84 deaths; France, 10 cases; Germany, 10 cases; Great Britain, 71 cases, 6 deaths; Greece, 178 cases, 37 deaths—“present in virulent form”; Guadalupe, “present”; Hawaii, 1 case; India, 4263 cases, 1920 deaths; Indo-China, 498 cases, 47 deaths; Italy, 6 cases; Japan, 140 cases, 22 deaths; Java, 503 cases, 120 deaths; Malta, 7 cases, 1 death; Mexico, 978 cases, 1108 deaths; Netherlands, 54 cases, 6 deaths; Persia, 140 deaths; Philippine Islands, 5 cases; Portugal, 63 cases; Russia, 1533 cases, 543 deaths; Siam, 2 cases, 1 death; Spain, 313 cases, 389 deaths; Straits Settlements, 152 cases, 42 deaths; Switzerland, 151 cases; Turkey in Asia, 97 cases, 41 deaths; Union of South Africa, 102 cases; Uruguay, 1 case; Venezuela, 2 cases, 3 deaths—“present”; Zanzibar, 1 case.

*Plague.* Argentina, 49 cases, 11 deaths; Azores, “present”; Brazil, 27 cases, 13 deaths; British East Africa, 7 cases; Ceylon, 140 cases, 218 deaths; Chile, 17 cases; China, 29 cases, 30 deaths; Ecuador, 830 cases, 319 deaths; Egypt, 1693 cases, 825 deaths; Great Britain, 11 cases, 4 deaths; Greece, 24 cases, 16 deaths; India, 125,830 cases, 102,589 deaths; Indo-China, 652 cases, 416 deaths; Java, 1109 cases, 1061 deaths; Mauritius, 17 cases, 8 deaths; Persia, 20 cases, 14 deaths—“present”; Peru, 456 cases, 240 deaths; Russia, 16 cases, 13 deaths; Siam, 449 cases, 402 deaths; Straits Settlements, 18 cases, 13 deaths; Union of South Africa, 46 cases, 36 deaths; Orange Free State, 36 cases, 23 deaths.

*Cholera.* Austria-Hungary, 1752 cases, 894 deaths; Borneo, 2 cases; Ceylon, 1 case, 1 death; China, 10 cases, 26 deaths; Egypt, 117 cases, 44 deaths; Germany, 1 death; Greece, 15 cases, 38 deaths; India, 632 cases, 2215 deaths; Indo-China, 3591 cases, 2171 deaths; Japan, 1676 cases, 706 deaths; Java, 144 cases, 186 deaths; Korea, 4 cases, 1 death; Persia, 136 cases, 176 deaths; Philippine Islands, 7245 cases, 4579 deaths; Russia, 4 cases, 1 death; Siam, 39 cases, 39 deaths; Straits Settlements, 9 cases, 4

deaths; Turkey in Asia, 793 cases, 348 deaths; Turkey in Europe, 168 cases, 82 deaths; at sea, 26 cases, 23 deaths.

**Yellow Fever.** Barbados, 20 cases, 8 deaths; Ecuador, 242 cases, 137 deaths; Martinique, 1 case, 1 death; Mexico, 32 cases, 12 deaths.

**Typhus Fever.** Algeria, 2 cases, 2 deaths; Argentina, 2 deaths; Austria-Hungary, 4060 cases, 7 deaths; Belgium, 1 death; Canada, 4 cases; Canary Islands, 3 deaths; China, 18 cases, 4 deaths; Colombia, "epidemic"; Cuba, 2 cases, 1 death; Egypt, 1909 cases, 811 deaths; France, 1 case, 1 death; Germany, 128 cases, 68 deaths; Great Britain, 49 cases, 18 deaths; Greece, 491 deaths; Italy, 55 cases, 15 deaths; Japan, 443 cases; Java, 274 cases, 69 deaths; Mexico, 6581 cases, 702 deaths; Netherlands, 1 death; Norway, 1 death; Russia, 2846 cases, 280 deaths; Spain, 4 deaths; Sweden, 16 cases; Turkey in Asia, 1286 cases, 269 deaths.

**VITAMINS.** Due to a certain dietary deficiency, there develops a nervous disease known as polyneuritis, which is speedily relieved by adding to the food ingested by the patient certain accessory food substances.

A variety of polyneuritis, called beriberi, is caused by a diet of rice from which has been removed the brownish envelope by over milling. This disease is cured by feeding unmilled rice, or foods that contain the accessory food substance which is found in the rice husk, in peas, beans, barley, or yellow corn meal. Fraser and Stanton, in 1912, dissolved the protective substance out of rice polishings with hydrochloric acid solution. Chamberlain and Vedder, in 1911, showed that the substance was water soluble, alcohol soluble, not ether soluble, dialyzable, and absorbed by animal charcoal. Casimir Funk obtained in the same year a crystalline base from rice polishings to which he gave the name "vitamin," believing he had isolated the substance in chemical purity. Although Funk presented an empiric formula for it, it is thought now that he had not isolated the pure substance, and it is claimed by chemists that the substance is not really an amin. The experiments and researches of others show that there are several accessory food substances which are very important in metabolism, and must be noted in preparing diets in institutions, and in combating such diseases as polyneuritis, pellagra, etc., while their exact rôle has not been determined. Each deficiency disease is probably caused by the absence of its particular vitamin. It has been shown by experiments with rats, by Funk and McCallum, that diets which produce neither scurvy nor beriberi may still be deficient in accessory food substances, and the rats fail to grow. The failure is due to the absence of two substances: one water soluble, one soluble in butter fat, both of which must be present in the food or there is no growth. More facts are necessary to determine the relations of these substances to each other, assuming that there is a group of vitamins. But it is a settled fact that they are essential to health and growth. See PELLAĞRA.

**VIVATOR.** See RESUSCITATION.

**VODKA.** See LIQUORS.

**VOGRICH, MAX.** An Austrian composer and pianist, died in New York, June 10, 1916. For some years he had been resident in the United States. Born in Szeben, Transylvania, in 1852, as a boy he gave great promise, so that he was

sent to study under Reinecke, Richter, Moscheles, and other great teachers. Between 1870 and 1878 he toured widely in concert, on the Continent, in the United States, and in South America. From 1882 to 1886 he lived in Australia, teaching and playing, and then he came to New York. His oratorio, *The Captivity*, was given by the Metropolitan Society in New York in 1891, and besides this he composed several operas, cantatas, masses, symphonies, and other music.

**VOGÜÉ, CHARLES JEAN MELCHIOR, MARQUIS DE.** A French historian and archaeologist, died in Paris Nov. 10, 1916. He was born in Paris in 1829. After an education at the Collège Henri IV, Paris, he became an attaché of the embassy at St. Petersburg. As a young man he was enabled to travel widely in Palestine and other Oriental countries, and the fruits of his explorations and studies were soon put into published form. In 1871 he was appointed Ambassador to Turkey and in 1875 was transferred to Austria, but left the diplomatic service five years later. In 1901 he was chosen a member of the French Academy, and he was also made a commander of the Legion of Honor. In the War of 1870 he served as vice-president of the French Red Cross and during the European war had been its head. He was also president of the Agricultural Society and of the Jockey Club. His earliest important archaeological work was *Les églises de la Terre Sainte*, in which he discussed the influence of East on West and vice versa at the time of the crusades. *Le Temple de Jérusalem, l'architecture civile et religieuse du Ier au VIème siècle dans la Syrie centrale* brought him admission to the Académie des Inscriptions et Belles-Lettres in 1868. *Jérusalem* and *Mélanges d'archéologie orientale* were other publications in this field, and often the illustrative drawings were by his own hand. The Marquis de Vogüé's historical works included: *Villars d'après sa correspondance* (2 vols.); *Lettres inédites du duc de Bourgogne et du duc de Beauvilliers, Malplaquet et Denain, Catalogue de la collection de Clerg; et Une famille vivaroise* (annals of his own distinguished family).

**VOLAVY, MARGARET.** See MUSIC, Artists, Instrumentalists.

**VOLCANOES.** Lassen Peak, Sierra Nevada Mountains, California, displayed evidences of activity at irregular intervals in 1916 as a continuation of the phase of spasmodic eruption which began in May, 1914. The stage of quiescence has not yet been reached, apparently, and there is still a possibility that a violent outburst may occur such as has seemed imminent at different times. The ejected materials have consisted of dust and broken and comminuted lava from earlier eruptions, with large quantities of steam, but no molten lava has been given out so far as known. The mud flows that were so prominent a feature in the first period and a cause of much damage to forest and agricultural lands in the vicinity have not been so much in evidence during the year.

**ELECTRIC POWER FROM VOLCANOES.** A notable power plant was put into operation in Italy during the year 1916 where the subterranean steam from a volcano in Central Tuscany near Volterra is used to generate power. Since 1903 Prince Ginori-Conti had experimented in this region and holes from 12 to 20 inches in diameter were bored in the ground and



pipes driven down to the source of the steam, usually about 300 to 500 feet below the surface. The borax salts and gases mixed with the steam made it impossible to use the steam directly in an ordinary engine, but by using it as a source of heat for an ordinary multi-tubular boiler in which steam was produced at a pressure of two atmospheres and then drying it by volcanic steam heat in a superheater it was found possible to use it to drive a 300-horse power condensing steam turbine direct connected to a three-phase generator. The plant installed during the year consists of three 3000 kilowatt turbo-generators designed to operate with superheated steam at one and one-half atmospheres. These deliver three phase electric current at 4500 volts, 50 cycles, which is stepped up to 36,000 volts for transmission to Florence, Leghorn, Volterra, Gusseto, and other towns in Tuscany. As coal was selling for from \$40 to \$50 a ton in Italy during 1916 this development of 15,000 horse power from natural heat was most advantageous. See *Engineering* (London, Nov. 17, 1916).

**VOLUNTEERS OF AMERICA, THE.** A Christian and social organization modeled on the United States army, and incorporated in 1896 under the laws of the State of New York. Although ruled by military discipline and methods, it is democratic in its constitution, which was framed by a Grand Field Council which consists of representatives of minor and local councils of officers elected annually. In 1916 the Volunteers had 56 homes and benevolent institutions in the leading cities and towns of the United States. In 1916 the Volunteer workers visited and aided 29,510 families, and gave 244,898 free lodgings in their charitable institutions. Lodgings were paid for by work found for 307,169 persons, free meals were given to 820,072 persons, and 410,103 meals were given to persons who paid for them either by money or by work. The Volunteer Prisoners' League had enrolled in 1916 upward of 81,000 members, had organized leagues in 30 State prisons, and by means of its Hope Halls had enabled more than 70 per cent of the discharged prisoners to lead better lives. During 1916 852,350 persons attended indoor meetings, and 2,118,196 persons attended open-air meetings. At these services 7601 persons were converted. At the Volunteer Hospital in New York City in 1916 there were 2023 ambulance calls, 9673 days' treatment given to patients in the surgical and medical wards, 7573 new cases treated, and 12,837 old cases treated. Large quantities of Christian literature were sent to the State prisons, jails, hospitals, soldiers' homes, and children's homes. In connection with the Volunteers there are also sewing classes, hospital nursing, temporary financial relief departments, fresh air camps, and many other worthy undertakings. The headquarters are at 34 West 28th St., New York City.

**VON CAPELLE, EDWARD.** See GERMANY, *History*, Peace Discussion.

**VON DER GOLTZ, KOLMAR, BARON.** See GOLTZ.

**VON HEIDENSTAM, KARL GUSTAF VERNER.** See VERNER VON HEIDENSTAM.

**VON KOERBER, ERNEST.** See AUSTRIA-HUNGARY, *History*.

**VON MACH, ERNST.** See MACH.

**VON MOLTKE, HELMUTH.** See MOLTKE.

**VON PODBIELSKI, VIKTOR.** See PODBIELSKI.

**VON POHL, HUGO.** See POHL.

**VON TIRPITZ, ALFRED.** See GERMANY, *History*, Peace Discussion.

**VOORHEES, THEODORE.** An American railroad president, died March 12, 1916, at Elkins Park, Pa. He was born in New York City in 1847, studied at Columbia, and graduated from Rensselaer Polytechnic Institute as a civil engineer in 1869. Thereafter till his death he was connected with one railroad or another. He held administrative positions on several roads in New York State, and by 1890 had become general superintendent of the New York Central, of which, for five years, he had been assistant general superintendent. In 1893 he became vice-president of the Philadelphia and Reading Railroad, and in 1914 its president.

**VOTING, ABSENTEE.** See ELECTORAL REFORM.

**VOTING, PREFERENTIAL.** See ELECTORAL REFORM.

**VREELAND, CHARLES E.** An American naval officer, died at Atlantic City, N. J., Sept. 27, 1916. He was born in New Jersey in 1852. After three months as a naval apprentice he was appointed to Annapolis in 1866. By 1871 he had become ensign and by 1906 rear admiral. In the war with Spain, he was a lieutenant on the *Dolphin*, having previously been a naval attaché at Vienna and Rome, and in 1907 he commanded the *Kansas* in the trip of the battleship fleet around the world. In 1909, while serving as commander of the second division of the Atlantic Fleet, with the *Delaware* as his flagship, he represented the navy at the coronation of King George V. Two years later he was chairman of the board (later called the Vreeland Board) which examined the wreck of the *Maine* and reported that it had been destroyed by an outside explosion. Rear Admiral Vreeland was an ardent supporter of an enlarged navy. He was retired for age in 1914 and had since lived in Washington.

**WAGES.** See MINIMUM WAGE.

**WAGNER, SIEGFRIED.** See GERMAN LITERATURE, *Drama*.

**WAIT, WILLIAM BELL.** An American educator of the blind and inventor, died in New York City, Oct. 25, 1916. He was born at Amsterdam, N. Y., in 1839, and was educated in the public schools of Albany and at the Albany Normal College, where he graduated in 1859. For two years he was a teacher in the New York Institute for the Education of the Blind, then studied law, and in 1862 was admitted to the bar. Instead of practicing, however, he accepted the principalship of the schools of Kingston, N. Y. From 1863 he was identified with the Institute for the Blind, as principal until 1905, and then as principal emeritus until his death. He devised the New York point alphabet for the blind and a system of musical notation; the kleidograph, a machine for embossing his point system on paper; a typewriter for the blind; and the stereograph, a machine for embossing metal plates. These inventions brought to Mr. Wait the John Scott medal of the Franklin Institute of Philadelphia in 1900. He published two books on his point systems; *The Normal Course of Piano Technic*; *Harmonic Notation*; *Phases of Punctography*; and *The Uniform Type*

**Question.** He helped to found the American Association of Instructors of the Blind.

**WALES.** See GREAT BRITAIN.

**WALKER, ASA.** An American naval officer, died at Annapolis, Md., March 7, 1916. He was born in 1845 at Portsmouth, N. H. Graduating from the United States Naval Academy at 21, he served on various stations and rose through the grades, reaching that of commander in 1894. During four periods between 1873 and 1897, he was on duty at Annapolis. In the latter year he took command of the U. S. S. *Concord*, and with it participated in the battle of Manila Bay, being advanced nine numbers for his services. Afterward he served successively at the Naval War College, on the Naval Examining Board, as commander of the *San Francisco*, member of the General Board, commander of the *Wabash*, and superintendent of the Naval Observatory at Washington. In 1907 he retired, having reached the rank of rear admiral the preceding year.

**WALKER, STUART.** See DRAMA.

**WALLACE, ALFRED RUSSEL.** See LITERATURE, ENGLISH AND AMERICAN, *History, etc.*, English.

**WALLACE, SIR WILLIAM.** A British colonial administrator and explorer, died at Axminster, Devonshire, England, July 11, 1916. He was born in 1856 in Arbroath. For 32 years, while administrator of the Niger Company's territories, his duties were concerned with the acquisition and consolidation of British interests in that region, and he did much, by treaties with the native chiefs and many military expeditions, to accomplish this end. As a result, the way was paved for the subjugation of the Fulani nation and the acquisition of Nigeria for the British Empire, after which event he became resident general in 1900, and from that year to 1910 served as deputy high commissioner and acting Governor of Northern Nigeria. Besides three West African medals, with five clasps, he received the C.M.G., being promoted K.C.M.G. in 1907, and for his explorations in Nigeria was awarded the Murchison grant by the Royal Geographical Society, which body elected him a fellow.

**WALPOLE, HUGH.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction and Essays*, English.

**WALTER, EUGENE.** See DRAMA.

**WAR BREAD.** See FOOD AND NUTRITION.

**WAR COMMITTEE, FRENCH.** See FRANCE, *History*.

**WAR COUNCIL, BRITISH.** See GREAT BRITAIN, *History*.

**WARD, MRS. HUMPHRY.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, English.

**WARD, WILFRID PHILIP.** A British Roman Catholic leader, author, and editor, died April 9, 1916, at Hampstead, London. The son of William George Ward, famous in connection with the Oxford Movement as "Ideal" Ward, Wilfrid Ward was born at Old Hall, Ware, in 1856, and was educated at St. Edmund's College, Ware, Ushaw College, Durham, and the Gregorian University, Rome. At Ushaw College, Mr. Ward became a lecturer in philosophy in 1890, and later was examiner to the Royal University of Ireland. From 1886 he was a member of the Council of the Catholic Union of Great Britain, in 1901 was appointed to the Royal Commission on Irish University Educa-

tion, and in 1915 lectured in Boston before Lowell Institute. Outside his own country he became best known as editor of the *Dublin Review*, for many contributions to such reviews as the *Quarterly*, *Edinburgh*, and *Contemporary*, and for his writings in book form, including: *William George Ward and the Oxford Movement* (1889); *William George Ward and the Catholic Revival* (1893); *The Life and Times of Cardinal Wiseman* (1897); *Ten Personal Studies* (1908); *John Henry, Cardinal Newman* (1912); *Mex and Matters* (1914).

**WARD, WILLIAM HAYES.** An American clergyman, editor, and Oriental scholar, died at South Berwick, Maine, Aug. 28, 1916. He was born at Abington, Mass., in 1835, the son of a minister. As a small boy he learned to read Hebrew, Latin, and Greek, and studied other subjects at home, then, after a final preparatory year at Phillips Andover, entered Amherst College. He graduated in 1856 and three years later finished his theological training at Andover Seminary. For a time he was a teacher and a Congregational minister in Kansas, but from 1858 he was known most widely for his connection with *The Independent*. By 1870 he had become superintending editor of this periodical, then chiefly a religious journal, from 1896 to 1913 he was editor in chief, and thereafter was honorary editor. During his period of active service he was ranked as one of the best editorial writers of the time. Dr. Ward's other chief interest was Oriental art. He lectured on Assyriology at Yale as early as 1878-79, and in 1884 he was chosen to lead the Wolfe archaeological expedition to Babylonia. From then on he was a leading scholar in his field, particularly in the department of seal cylinders. Of these he made a collection which was bought by J. Pierpont Morgan, and he wrote an important work on *The Seal Cylinders of Western Asia* (1909). But Dr. Ward combined with his interest in a past civilization a passion for all the liberalizing movements of his own time. He identified himself with the anti-slavery cause and with the early efforts toward woman's rights, and he labored constantly against sectarianism in religion. It was he who initiated the project which resulted in the organization of the Federal Council of Churches of Christ in America. Honorary degrees were conferred on him by New York University and Amherst, of which he was long a trustee, and from 1890 to 1894 and again in 1909-10 he held the presidency of the American Oriental Society. Indicative of the field in which Dr. Ward found his chief literary pleasure, poetry, is his *Biography of Sidney Lanier* (1885). The younger American writers of verse found in him a discriminating critic and champion. His last book, *What I Believe and Why*, was published in 1915. Consult memorial issue of *The Independent* (Sept. 11, 1916).

**WAR LOANS.** See FINANCIAL REVIEW, *Foreign Exchanges*.

**WAR OF THE NATIONS, THE.** The history of the war during the year 1916 is treated below under the following captions:

- I. THE WAR IN BRIEF.
- II. THE SITUATION ON JAN. 1, 1916.
- III. THE DIPLOMACY OF THE WAR.
  - The War Council at Paris.
  - The Allies' Economic Conference.

Italy and the Entente.

The Intervention of Portugal.

Rumania and Austria-Hungary.

Relations between Greece and the Entente.

The Question of Polish Relief.

The Promise of Polish Autonomy.

Discussion of Peace and of Peace Terms.

Pope Benedict XV and Peace Overtures.

#### IV. MILITARY OPERATIONS.

- (1) The Conquest of Montenegro (January).
- (2) The Invasion of Albania (January-February).
- (3) Russia's Winter Offensive (January).
- (4) The Fall of Erzerum (February).
- (5) First Battle of Verdun (February).
- (6) Verdun: Second Phase (March-April).
- (7) The Russian Diversion (March).
- (8) The Allies' War Council (March).
- (9) The Austrian Invasion of Italy (May-June).
- (10) Verdun: Third Phase (May-June).
- (11) The Russian Drive (June-August).
- (12) The Anglo-French Offensive on the Somme (July-December).
- (13) The Italian Recovery (June-August).
- (14) Russian Victories in Asia Minor (February-July).
- (15) British and Russian Reverses in Mesopotamia, Persia, and Kurdistan (April-August).
- (16) Rumania's Intervention (August).
- (17) Hindenburg in Power (August).
- (18) The Collapse of Rumania (September-December).
- (19) The Situation in Macedonia.
- (20) The French Counter-Stroke at Verdun (October-December).
- (21) Conquest of Kamerun and German East Africa.
- (22) Estimated Losses.

#### V. NAVAL OPERATIONS.

The Naval Battle of Jutland (May 31).  
Minor Naval Losses.

Submarines and Commerce Raiders.

#### VI. AERIAL WARFARE.

##### I. THE WAR IN BRIEF

On June 28, 1914, the Austrian heir-apparent, Archduke Francis Ferdinand, was assassinated with his wife at Sarajevo. Accusing Serbia of complicity in the crime, and alleging that the anti-Austrian machinations of Serbian patriots menaced the integrity of the Habsburg empire, Austria-Hungary on July 23, 1914, delivered an ultimatum containing demands with which the Serbian government would only partially comply. Despite the diplomatic remonstrances of other Powers, Austria-Hungary refused to submit the matter to peaceful arbitration and declared war on Serbia, July 28, 1914. The Russian government, frankly sympathetic with Serbia, ordered the mobilization of the Russian army and declined to countermand the order, whereupon the German government declared what it considered to be defensive war against

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Russia, Aug. 1, 1914. Two days later, Germany declared war against Russia's ally, France. Preparatory to the invasion of France, German troops had already occupied the neutral duchy of Luxemburg, August 2, and begun to invade Belgium, August 4, notwithstanding Belgian opposition. The British government construed the German violation of Belgian neutrality as a *casus belli* and declared war against Germany, August 4. Serbia and the "Allies," or Entente Powers—Russia, France, and Great Britain—were subsequently joined by Montenegro (Aug. 7, 1914), Japan (Aug. 23, 1914), Italy (May 23, 1915), Portugal (March 9, 1916), and Rumania (Aug. 27, 1916). The "Teutonic" or Central Powers—Austria-Hungary and Germany—on the other hand, while they failed to receive the support of their former confederate, Italy, succeeded in enlisting the aid of Turkey ("state of war" with Russia, October 30th; attacked by Great Britain and France, Nov. 5, 1914) and Bulgaria (Oct. 14, 1915).

From the outset the British and Allied navies commanded the seas, putting an end to German over-seas commerce and compelling the German battleships for the most part to remain in home waters under the protection of coast defenses and mines, although the main German battle fleet once ventured out to fight an indecisive battle off Jutland, May 31, 1916, and swift German battle-cruisers repeatedly raided the British coast. The naval engagements in the Bight of Heligoland (Aug. 24, 1914), off Coronel (Nov. 1, 1914), off the Falkland Islands (Dec. 8, 1914), and near Dogger Bank (Jan. 24, 1915) were of secondary importance. A few daring German commerce raiders and the surprisingly effective German submarines were able to inflict considerable damage upon the Allied and neutral merchant marines, but not to break the virtual blockade by means of which Great Britain hoped to starve out her principal enemy.

The military operations may be briefly summarized as follows: (1) In the Franco-Belgian theatre, the gallant Belgian defense of Liège (Aug. 4-5, 1914), the stand at Mons-Namur-Charleroi (Aug. 21-24, 1914), and a French counter-invasion of Alsace-Lorraine (August, 1914), failed to stop the onward sweep of the German armies through Belgium, Luxemburg, and Lorraine toward Paris. The high tide of the German invasion was reached in the battle of the Marne (Sept. 6-10, 1914), after which the German right wing fell back upon the Aisne River and extended itself northward through Picardy, Artois, and Flanders to the Belgian coast. From October, 1914, to December, 1916, the long intrenched battle line from Flanders to Upper Alsace remained almost stationary, although terrific attempts to break through were made by the Germans in Flanders (October-November, 1914), again at Ypres (April-May, 1915), in the Argonne (July, 1915), and at Verdun (February-July, 1916); as well as by the Allies at Neuve Chapelle (March 10, 1915), in the region just north of Arras (May-June, 1915), in Champagne (September-October, 1915), in Artois near Lens (September-October, 1915), and in the valley of the Somme River (July-December, 1916). (2) In the East, the initial Russian offensive in East Prussia was shattered by Hindenburg at Tannenberg (Aug. 26-31, 1914); an Austro-German coun-

ter-invasion of Russian Poland was checked before Warsaw (February, 1915); Russian armies invading Austrian Galicia attained the passes of the Carpathians early in 1915 but were almost completely expelled from Austrian territory by "Mackensen's Drive" (May-June, 1915); and an Austro-German invasion of Russia under the masterly direction of Field Marshal von Hindenburg, after conquering Warsaw (August 4th), Brest-Litovsk (August 25th), and Vilna (Sept. 18, 1915), was halted only by the swamps before Riga, the lakes around Dvinsk, and the marshes of the Pripet. The Russians returning to the attack in 1916 (June-August) recaptured the Volhynian fortresses of Lutsk and Dubno, conquered the Bukovina, and penetrated up the Dniester River in Galicia as far as Halicz. (3) After two important Austro-Hungarian attempts to "punish Serbia" had failed (in August and in December, 1914), a new Austro-German invasion of Serbia was undertaken in October, 1915, with the aid of Bulgaria, and by Dec. 5, 1915, Serbia was completely conquered. Anglo-French forces endeavoring to succor Serbia were defeated in the battle of the Vardar (December, 1915), and driven back upon their base, Saloniki, in Greek territory; Montenegro and northern Albania were overrun by Austrian and Bulgar armies (January-February, 1916); in the summer of 1916, however, the composite Allied army of Saloniki assumed the offensive and wrested the Serbian town of Monastir (November 19th) from the Bulgars.

(4) Rumania, entering the war on Aug. 27, 1916, too rashly sent her armies to "emancipate" Transylvania, leaving the Dobrudja undefended against Mackensen; the Rumanian invaders of Transylvania were thrown back in confusion by Falkenhayn; and all western Rumania, including Bucharest (December 6th), was conquered by German, Austro-Hungarian, Bulgar, and Turkish forces. (5) Turkish armies held the Dardanelles against Anglo-French assaults (February, 1915, to Jan. 8, 1916); delivered futile attacks upon the Suez Canal; captured a British army under General Townshend in Mesopotamia (April 28, 1916); and expelled the Russians from Kermanshah (July 5, 1916) and Hamadan (Aug. 10, 1916) in Persia; but were unable to defend the important Armenian cities of Erzerum (Feb. 16, 1916), Trebizond (April 18th), and Erzingan (July 25th) against the Grand Duke Nicholas's advance. (6) The Italians, having painfully penetrated a few miles into the Trentino, were rudely repulsed in May, 1916; towards Trieste the Italians made slow progress and finally captured Gorizia, Aug. 9, 1916. (7) All of the German colonies were taken: Kiaochow (in China) by the Japanese (Nov. 6, 1914); the German island possessions in the Pacific by British and Japanese expeditions; Togoland (August, 1914), Kamerun (February, 1916), German Southwest Africa (July, 1915), and German East Africa (incomplete conquest, 1916) by British, Boer, French, and Belgian forces.

Detailed accounts of the events here summarized will be found in the YEAR BOOKS for 1914 and 1915 under WAR OF THE NATIONS, as well as in the present article. See also the cross references given at the end of this article.

## II. THE SITUATION ON JANUARY 1, 1916

To the close of the year 1915, the most impressive events of the War of the Nations had been spectacular but incomplete demonstrations of German military superiority. In 1914, Belgium and a considerable section of Northern France (one twenty-fifth of the total area of France) had been overrun by German armies; but the French army, prudently commanded by General Joffre, had remained unshattered, and despite reckless sacrifices of men the Germans had failed to reach Calais and the Channel coast. In the summer of 1915, the Russian "steam roller" had been trundled back from Galicia and from Russian Poland to the Riga-Dvinsk-Pripet Marshes-Tarnopol line in a badly battered condition; but Field Marshal von Hindenburg had striven in vain to complete his victory by winning Riga and Dvinsk, and the Russian army, though terribly defeated, was not annihilated. In the closing months of 1915, Bulgaria had been won over to the Turco-Teutonic coalition, and had helped Field Marshal von Mackensen to conquer Serbia, thus giving the Central Powers military and commercial control of the vastly important railway route from Germany and Austria-Hungary through Nish and Sofia to Constantinople and even—thanks to the dismal failure of the Anglo-French Dardanelles campaign—through Asia Minor to Mesopotamia; but an Anglo-French expeditionary force was allowed to intrench itself at Saloniki where it constituted a standing menace to the Bulgarian occupation of Serbia. These three gigantic offensives had won glorious laurels for the German generals and new territories for the Central Powers, but still the Russian army was able to stand at bay, and the "contemptible" little British expeditionary force in the West had been swelled by repeated reinforcements until it was a million strong. General Joffre was planning an ambitious Anglo-French forward movement for the spring of 1916. The German military machine had brilliantly proved its ability to carry out smashing, irresistible offensives; it had demonstrated its amazing mastery of the new science of trench warfare, which enabled numerically inferior German forces to hold General Joffre's "forward movements" in check; but it had not won the war. Hence it was not surprising that whereas statesmen and journalists in Germany expressed a puzzled inability to understand the stubborn refusal of the defeated Entente Allies to sue for peace, French and British publicists, on the other hand, gave voice to the immutable conviction that the "just cause" and preponderant resources of the Entente Allies must ultimately triumph. The war, insisted the Allies, would be decided not by battles, or by campaigns, but by man-power, munitions, and economic resources. Thus Mr. Winston Spencer Churchill, a prominent English Liberal, with a sublime contempt for ephemeral German victories, proclaimed his belief that: "It is not necessary for us to win the war to push the German line back over all the territory they have absorbed, nor to pierce it. While the German lines extend far beyond their frontiers, while their flag flies over conquered capitals and subjected provinces, while all the appearances of military success greet their arms, Germany may be defeated more fatally in the second or third year of the war than if the Allied armies had

entered Berlin in the first year." The factors on which Mr. Churchill, in common with other Entente and pro-Entente observers, counted to ensure the Allies' final victory may be summarized under five heads: (1) Military manhood. The Turco-Teutonic coalition, if we may place confidence in the calculations of Mr. Hilaire Belloc, one of the foremost English historians of the war, was vainly striving by spectacular strategy to conceal the alarming wastage of its military manhood, while the Entente Powers were just beginning to draw upon their human resources. In like vein, Mr. Churchill predicted that, although at the beginning of the war the Germans had been superior in numbers, at the end of the second year the Germans would be outnumbered. Counting upon the Allies' resources in men, the French military critics praised General Joffre's costly "war of attrition," which by persistent pin-pricks would bleed the German army to death. In England, Lord Derby's recruiting campaign, backed up by a Compulsory Service bill, represented the first serious effort to utilize Britain's man-power (see GREAT BRITAIN, *History*). In Russia, there were certainly millions of able-bodied men, provided they could be adequately armed, trained, and officered, to replace the millions Grand Duke Nicholas had lost. Italy was by no means hard-pressed. France, alone of the Allies, had already put forth her maximum effort, and now, with grim courage, was sending mere striplings to the front.

(2) Economic resources. Even should the Allies fail to overwhelm the Central Empires by sheer weight of numbers, it was believed that the failure of Germany's economic resources would bestow the final victory upon the financially invincible coalition of London and Paris. After a year and a half of the war Germany was "nearly sucked dry," said Mr. E. S. Montague, M.P., Financial Secretary to the Treasury of Great Britain. The Entente, on the other hand, had hardly begun to draw upon its immense reserves; thanks to their own vast industrial resources, thanks also to their unshaken foreign credit, the Allies would be able to produce and purchase an inexhaustible supply of munitions; meanwhile Germany's approaching exhaustion would manifest itself in a bankrupt treasury, a failing food-supply, a ruined commerce, impoverished industries, and a diminishing flow of munitions. German economists, it is only fair to remark, published elaborate statistical statements to prove the ability of Germany to endure to the end, thanks to the willingness of her patriotic citizens to invest in the government's war-loans, and thanks also to the more efficient management of internal resources. In fact, the very inability of Germany to purchase supplies abroad was esteemed a financial asset, inasmuch as it prevented Germany from involving herself too heavily in debt to foreign creditors. Furthermore, the partisans of the Germanic Powers pointed out that the military successes of the Turco-Teutonic armies had immensely improved the economic situation of the Central League: the rich coal and iron regions of Belgium and Northeastern France (especially the Briey Basin, in Lorraine) were now supplying raw materials for the Krupp arsenals; the fertile plains of Poland and other Russian provinces, though woefully devastated, were expected to feed the German army of the east; the cattle and the copper

mines of Serbia and the food-products of the Balkan countries in general had been made available by Mackensen's drive through Serbia; and the Turkish victory over the Anglo-French forces on Gallipoli had ensured the safety of German communications with the Empire of Turkey in Asia, which if properly developed might supply Germany with much-needed meat, oils, cotton, and copper. Nevertheless, "in spite of the fact that the Central Powers have increased their reserves of men and materials by their successes," Lloyd George continued to boast that the Entente Powers had "an overwhelming superiority in the raw material of war" (Lloyd George, speech in the Commons, Dec. 20, 1915).

(3) Naval supremacy. With increasing frequency as the war dragged on, allusion was made to the historic parallel of the present war, the contest between Napoleon's military might and Britain's naval supremacy. As sea-power at the beginning of the nineteenth century had brought about the collapse of Napoleon's military empire, so it was assumed that in this present war of the twentieth century England's super-dreadnoughts would triumph over Germany's armies. Command of the seas enabled the Allies to utilize their own resources to the full, to preserve their own trade, to "capture" German trade, in part at least, and to institute a virtual blockade of Germany. Grand Admiral von Tirpitz's attempt to break the blockade by means of submarines had caused appreciable loss to British shipping and much annoyance to neutrals, but it had not even weakened the blockade. It remained to be seen whether German efficiency, which had already staved off a food crisis, could so wisely regulate the economic life of the nation, and so advantageously exploit the resources of Belgium, Northeastern France, Poland, the Balkans, and Asiatic Turkey, that the pressure of the British blockade would be unable to render nugatory the victories of German arms.

(4) Diplomacy. While confident in the ability of the Allies ultimately to defeat the Central Powers, public opinion in Entente countries anxiously awaited the intervention of new allies, whose armies might hasten the decision. Greece, it was hoped, would soon be persuaded, or constrained, to join the Entente; Portugal would surely come to the support of Great Britain; Spain and the Netherlands, though more doubtful, might in the end cast their lot with the victors; even the United States might conceivably enter the war in anger at German submarine outrages; above all, Rumania was momentarily expected to declare war against Austria-Hungary in the hope of conquering from the Dual Monarchy at least part of the coveted provinces of the Bukowina, Transylvania, and the Banat. The Germans, however, not only discounted the probability of war with Rumania, with the United States, with Spain, the Netherlands, or Greece, but even discussed the possibility that indignation at the Allies' interference with her trade might lead Sweden to attack the Entente.

(5) Finally, the spokesmen of the Entente Powers continued to voice the hope that the Central Powers would be embarrassed by internal disorders; that the more liberal parties in Germany would rebel against "Prussian militarism"; that the Slavic nationalities in Austria-Hungary would refuse to fight longer for a distasteful government; and that the Arabs would

rise against the Turks and the saner elements in Turkey would become disgusted with Enver Pasha's "Young Turk" clique. Reports of Socialist demonstrations in Germany, of riots and mutinies in Austria-Hungary, and of unrest in Turkey bolstered up the conviction of the Allies that in defending the cause of "liberty, democracy, and humanity" against Prussian "militarism," and Turkish "barbarism," they might to some extent enlist the secret sympathy if not the open aid of the "oppressed masses" in the Central Powers and Turkey.

### III. THE DIPLOMACY OF THE WAR

In a war of endurance—as the War of the Nations has clearly revealed itself—diplomacy may prove more decisive than gunnery. That the Entente Allies would possess the important advantage of a more skillful diplomacy was at first taken for granted by most observers who had followed in detail the apparently clumsy maneuvers of the German and Austrian foreign offices during the historic 13 days, July 23rd to August 4th, at the outbreak of the war; since August, 1914, however, the Central Powers had in a large measure retrieved their diplomatic reputation by successfully enlisting Turkey (Oct. 30, 1914), and Bulgaria (Oct. 14, 1915) as active allies, by preserving effective solidarity in their conduct of the war, by calculating to a nicety the limit of President Wilson's forbearance on the submarine question, and by fostering a very influential pro-German propaganda in Sweden, Spain, Greece, the United States, and other neutral countries. The diplomats of the Entente, on the other hand, had fatally bungled the Balkan situation; one of their intended Balkan allies, Bulgaria, had become an avowed enemy and the other two, Greece and Rumania, still remained uncertainly neutral. Italy's aid had been purchased dearly, and only after protracted bargaining. Most of all, the ineptitude of Entente diplomacy had been exhibited in the failure of the Allies to subordinate their own immediate political aims to the general advantage of the coalition. Italy had striven simply for her own territorial aggrandizement in the Trentino, toward Trieste, and in Albania; France had fought with more valor than calculation for the emancipation of her national territory; Russia's gigantic military efforts had been futile because they had not been coordinated with those of the Allies and because they had been undertaken without previous provision of adequate munitions; Serbia and Montenegro had been left disastrously to shift for themselves, the weak Anglo-French expedition to Saloniki being a diplomatic as well as a military failure; and Sir Edward Grey had suffered Great Britain's prestige in the Near East to be ruined by the failure of other ill-supported offensives, at the Dardanelles and in Mesopotamia. The Pact of London (Sept. 5, 1914), binding the Allies not to negotiate peace separately, had been a notable achievement, but it was becoming painfully obvious that a further agreement was needed, to secure the maximum effort from each of the Allies, to arrange a joint plan of campaign, and to decide in advance the terms upon which the war might be concluded.

THE WAR COUNCIL AT PARIS. Only by a long series of discouraging defeats were the Allies

taught the necessity of coöperation. After Russia's field army had been routed by Hindenburg; after the Anglo-French offensive of September-October, 1915, had proved to be merely another "nibble" at the German line; after Serbia had been conquered; after Gallipoli had been ingloriously evacuated; after Townshend had been surrounded at Kut-el-Amara; after the French lines around Verdun had been battered back from village to village and from hill to hill by the German Crown Prince's terrific attacks (see below, IV, 5)—only then did the Allies decide to hold a joint council of war. On March 27-28, 1916, the first general war council (an Anglo-French war council had been created in November, 1915) of the Entente Allies was held in Paris. France, Great Britain, Italy, Belgium, Serbia, Russia, Japan, Montenegro, and Portugal were represented, the first five by their premiers and foreign ministers, the others by ambassadors or ministers; Joffre, Castelnau, Kitchener, Robertson, Cadorna (Italian chief of staff), and Gilinsky (side-de-camp to the Czar) attended in person to give authoritative military information; while Lloyd George, British minister of munitions, and Albert Thomas, French secretary of state for munitions, reported on the all-important subject of the material equipment of the armies. The diplomatic unity of the Entente was reaffirmed by the war council. In order to secure unity of military action, an agreement was concluded among the general staffs of the various nations; the resignation of the Russian war minister, Polivanov, on March 29th, and of the Italian war minister, Zupelli, on April 5th, seemed to indicate that the military policies of Italy and of Russia had received unfavorable criticism at the war council; for the summer of 1916, concerted attacks on the Western, the Eastern, the Italian, and the Balkan fronts were planned. As for economic unity, the war council decided (a) to establish in Paris a permanent committee, representing all the Allies, to strengthen the blockade of the Central Powers; (b) to continue the Central Bureau of Freights in London and to take common action for the reduction of exorbitant freight rates and for the more equitable apportionment of the burdens of maritime transport; (c) to participate in an Economic Conference to be held shortly in Paris.

THE ALLIES' ECONOMIC CONFERENCE. Among the frequent consultations and conferences which followed in the wake of the general war council, the most significant was the Entente Powers' Economic Conference, which convened at Paris, June 14th-17th. The need of such a conference had already been emphasized by the general war council in March and by an Allied inter-parliamentary conference at Paris in April. The June Economic Conference during its brief session of three days agreed upon a far-reaching scheme of economic solidarity, which would not only enhance the effect of the blockade of the Central Powers during the war, but would also prolong the commercial struggle after the war by enforcing a partial exclusion of German manufactures from Entente countries and by establishing within the Entente a uniform system of laws respecting patents, corporations, bankruptcy, etc. In effect, the Entente Powers were to consolidate themselves into a huge economic coalition, a formidable engine of trade-war even in time of peace. The adoption of a scheme of

preferential tariffs among the Entente Powers, hinted at but not definitely proposed by the Economic Conference, would be the logical conclusion of such a policy. (See GREAT BRITAIN and FRANCE, paragraphs on *History*.) It may be noted in this connection that shortly after the June conference the Entente Powers proceeded formally to repudiate the Declaration of London as a code for maritime warfare and that Great Britain even went so far as to draw up an official "blacklist" of firms with German affiliations (for American protests against the British blacklist, see UNITED STATES AND THE WAR.) See TARIFF.

**ITALY AND THE ENTENTE.** In order that the war against German trade might be pushed with the utmost effect, it was urgently necessary that Italy be induced to abandon her absurd pretense of remaining at peace with Germany while at war with Austria-Hungary. Italy's delay in declaring war against Germany had given rise to a suspicion that the Italian government was playing false. In February, however, the Allies induced the Italian government to issue a decree prohibiting the exportation of German or Austrian merchandise through Italy as well as the transit through Italy of commodities for Germany or Austria-Hungary. The French Prime Minister, who visited Italy in February, apparently persuaded the Italian government to take the still more drastic action (February 29th) of requisitioning the 34 German merchant steamers interned in Italian ports. In March Italy participated in the Allies' general war council at Paris (above); early in April the British Premier, Mr. Asquith, visited Rome and conferred with Signor Salandra; in June Italy sent representatives to the Economic Conference at Paris; but still the declaration of war against Germany was not forthcoming. At length, however, on August 27th, Italy formally declared herself at war with the German Empire, since the German Empire was aiding Italy's enemies, Austria-Hungary and Turkey.

**THE INTERVENTION OF PORTUGAL.** The coalition of the Entente Powers was enlarged as well as consolidated during the year 1916. Portugal bound by treaty of alliance to furnish England with 10,000 troops, had promptly signified her willingness to assist her ally, in 1914, but had not been called upon to take action until February, 1916, when at Sir Edward Grey's request the Portuguese government commanded all German merchant vessels interned in Portuguese waters. Germany thereupon declared war against Portugal, March 9th, and Austria-Hungary followed suit, March 15th; in justifying the declaration of war, the German government asserted that Portuguese neutrality had been repeatedly violated, as, to cite but a single instance, in permitting British troops to pass through the Portuguese colony of East Africa or Mozambique. The intervention of Portugal was of little military advantage to the Entente, but it enabled the Allies to utilize the 40 Austrian and German ships confiscated by Portugal, and it might open a wider field for colonial bargains when the time arrived for peace negotiations. See PORTUGAL, *History*.

**RUMANIA AND AUSTRIA-HUNGARY.** Rumania also entered the war in 1916, as an enemy of Austria-Hungary. Before the war, Rumania had been affiliated with the Triple Alliance, on the basis of a defensive agreement, but since the

Balkan Wars of 1912-13 Rumania had shown a marked leaning toward Russia, and since the outbreak of the War of the Nations the Entente diplomatists had strained every nerve to win Rumania's support. During the first two years of the struggle, however, Rumania had remained neutral, whether because King Ferdinand was a Hohenzollern, or because Russia refused to offer Bessarabia as part of the price of Rumania's aid, or because the Rumanian war office feared to try conclusions with the conquerors of Poland or Serbia, or because Rumanian landlords found it too profitable to sell their wheat to the Central Powers. The moment Rumania entered the war she would lose the Austro-German market for her grain, meat, and petroleum, and the hostile league of the Central Powers would become an impenetrable wall barring direct commerce with all other nations except the Russian Empire, which could neither purchase Rumania's grain nor supply Rumania with manufactures and munitions. Isolated and inadequately equipped, Rumania might easily suffer the fate of Serbia. To declare war would be suicidal, unless victory could be certainly and speedily achieved. Therefore Rumania hesitated. On April 7th the Rumanian minister in Berlin signed a convention with Germany, providing for free interchange of domestic products. The situation took on a different aspect in the summer, when Russia inaugurated a successful offensive (see below, IV, 11) against Austria-Hungary and threatened to conquer for herself the provinces of the Bukovina and Transylvania, so ardently coveted by Rumanian irredentists. The Anglo-French victories on the Somme in July, the Italian conquest of Gorizia on August 9th, and the pretentious preparations of General Sarrail at Saloniki seemed to indicate that the Teutonic armies were no longer able to hold their own. Then Rumania struck. On August 27th the Rumanian crown council held a protracted session under the presidency of King Ferdinand and decided upon war. On August 28th the Rumanian minister at Vienna presented to the Austro-Hungarian foreign minister Rumania's declaration of war (effective August 27th). To the press the Rumanian government explained that although Rumania had formerly been in defensive alliance with the Dual Monarchy, altered circumstances constrained her to resume full liberty of action and to join the Entente Powers in order to safeguard her national interests and to emancipate the 3,000,000 Rumanians resident in Austria-Hungary. Germany, Turkey, and Bulgaria, as allies of Austria-Hungary, declared war against Rumania. From the statements subsequently made by the Austro-Hungarian foreign minister, and from the ease with which the Rumanians were able to invade Transylvania, it appeared that the Central Powers had been misled regarding Rumania's intentions and that by diplomatic pressure of a very strenuous character the Entente had hastened Rumania's intervention. For Rumania, intervention very soon meant disaster (see below, IV, 18), but for Entente diplomacy it was an undoubted, though tardy, success. See RUMANIA, *History*.

**RELATIONS BETWEEN GREECE AND THE ENTENTE.** For the failure of Entente diplomacy to induce Greece to join Rumania in attacking the Central Powers, four reasons may be assigned. In the first place, the Dardanelles fiasco, the an-

nihilation of Serbia and Montenegro, and the Anglo-French defeat on the Vardar (see *YEAR BOOK* for 1915) confirmed King Constantine's profound belief in the superiority of the German military machine; it is significant that when Rumania entered the war, exultantly confident of an easy triumph, Constantine shrewdly predicted that Rumania would speedily be conquered by German armies. Secondly, to jealous Greek observers the promise of Constantinople to Russia (see below *Discussion of Peace and of Peace Terms*) presaged the unwelcome advent of Russian Pan-Slavism as the dominant influence in the Balkans. Thirdly, the occupation of southern Albania by Italian forces antagonized Greek patriots who had cherished the hope of annexing that region to Greece. And in the fourth place, by encamping on Greek soil at Saloniki (see below IV, 19), and by vexatiously interfering with the rights of Greece as a sovereign and neutral state, the Allies outraged Greek pride without overawing Greek resentment.

First the Anglo-French expeditionary force had landed at Saloniki in October, 1915, and marched up the Vardar through Greek territory to Serbia, in disregard of M. Venizelos's formal (though confessedly insincere) protest. Then the Allies had claimed the right to retreat into Greek Macedonia in December, 1915, and fortify Saloniki, again disregarding Greek protests. Next, the remnant of the Serbian army had been landed on the Greek island of Corfu and the use of Greek railways demanded for the transportation of Serbian troops to Saloniki. In justification of these violations of Greek neutrality the Allies explained that since Greece and Serbia had signed a defensive alliance\* in May, 1913, neutrality was dishonorable to Greece. Furthermore, Great Britain, Russia, and France, as guaranteeing Powers under the treaties of 1863, asserted the right to interfere in the purely domestic affairs of Greece in case it should be necessary to prevent the overthrow of the Greek constitutional government; Constantine, they claimed, had violated the constitution in November, 1915, by arbitrarily dissolving the pro-Entente Chamber of Deputies which had been elected in June, 1915; the pro-German Chamber elected in December, 1915, was therefore regarded as unrepresentative and unconstitutional; hence the Allies considered it their "imperative duty" to intervene in behalf of Greek liberties. On June 21, 1916, the British, French, and Russian ministers presented a collective note at Athens, demanding (1) complete demobilization of the Greek army, (2) dismissal of the unfriendly Skouloudis ministry and appointment of a pro-Ally ministry, (3) dissolution of the pro-German Chamber of Deputies and election of a new Chamber under constitution conditions, and (4) removal of certain pro-German police officials. King Constantine immediately appointed Zaimis as Premier and promised full compliance with the Allies' demands, June 23rd. In September Zaimis was compelled to yield Greek telegraphs and posts to Anglo-French authorities. Lambros, who became Premier in October, was forced to surrender the Greek navy to the French Admiral du Fournet, October 11th and 16th; all German, Austro-Hungarian, Turkish,

and Bulgarian diplomatic representatives were unceremoniously expelled from Greece; Athenian newspapers were subjected to French censorship; Anglo-French marines were landed; an Anglo-French squadron trained its guns on Athens; the coast of Greece was blockaded; and Constantine was compelled not only to transfer his troops to the southernmost parts of Greece but also to turn over to the Allies a considerable part of the munitions and artillery of the Greek army. By the end of December the Allies had substituted coercion for diplomacy in dealing with Greece. See also *GREECE, History*.

The very fact that Constantine was not overthrown by a popular insurrection proved that the Entente had failed to win the sympathy of the bulk of the Greek nation. In Macedonia, however, where all pro-German agitation had been summarily suppressed by Anglo-French military authorities, and in the islands acquired by Greece in 1913, a pro-Entente insurrection was protected by the Entente; and its leader, Eleutherios Venizelos, the very able champion of an Anglophilic policy, was recognized as head of a provisional government in Crete and Macedonia. Venizelos declared war against Bulgaria, and his supporters volunteered to fight at the side of the Allies. In sum, the net result of the Entente's policy toward Greece had been to force the Greek government into an attitude of ill-concealed hostility and to win the insignificant military aid of a few thousands of Venizelist insurgents.

**THE QUESTION OF POLISH RELIEF.** One of the most tragic features of war-diplomacy was the failure of negotiations for Polish relief. The Teutonic invaders of Russian Poland in the autumn of 1915 had found the country battle-scarred and desolate; the retreating Russians had systematically devastated the land in order that the invaders might profit little by their conquest. Crops were burned. Cattle were driven away or killed, with the result that for lack of milk thousands of very young children perished. With the hope of relieving the misery of the Poles and Lithuanians, the United States government on Feb. 21, 1916, asked Great Britain for permission to send about 40,000 tons of foodstuffs monthly to be distributed among the civilian inhabitants of Warsaw, Lodz, Tchenstochova, Vilna, Kovno, and Biala Etappe, under the supervision of an American commission, on condition that the remainder of the civil population be cared for by Germany, and that imported foodstuffs be used solely for the needs of the civilian population. Great Britain and Russia, however, in their reply (dated May 10th) imposed the conditions that (1) the parts of Poland and West Russia under Austro-Hungarian occupation be included as well as the parts under German occupation, (2) that no native products be consumed by the constabulary, and (3) that Germany and Austria-Hungary undertake to provide for Serbia, Albania, and Montenegro. Germany rejected the Anglo-Russian stipulations, May 30th. A new humanitarian appeal from the United States, July 7th, elicited from Great Britain a proposal to permit the entry of food-imports into Poland, provided that all of the produce of Belgium, Northern France, Serbia, Montenegro, and Albania, as well as of Poland and Western Russia, be reserved for the native inhabitants of those re-

\* On August 15, 1916, *Le Temps* published what purported to be the text of the Greco-Serb treaty, on the authority of the Geneva correspondent of *Le Temps*.



gions, and provided that the work of relief be supervised by neutral agents. This proposal involved the principle that an invading army had no right to derive even a portion of its food-supply from conquered territory—a principle which Germany was quite unprepared to admit. The German and Austro-Hungarian governments therefore declined the British proposal, and the German Emperor informed President Wilson that owing to the cruel British blockade policy nothing could be done. Viscount Grey, for his part, accused the Central Powers of insincerity and inhumanity and charged them with attempting "to confuse issues and throw the greatest possible amount of odium upon the Allies"; Germany, he alleged, was simply pursuing "a deep policy of exciting public opinion against the legitimate use of sea power by those who are fighting for the principle of nationality."

**THE PROMISE OF POLISH AUTONOMY.** In accordance with the Allies' professed championship of the principle of nationality, the Poles had been promised unity and autonomy by the then Russian commander in chief, Grand Duke Nicholas, in the first month of the war; a year later Premier Goremykin had renewed the promise and announced that the Russian council of ministers had authority to draft a bill for Polish autonomy; but subsequently, Goremykin had been superseded by Stürmer, and the new Premier had delayed the announcement of definite plans regarding Poland's future; indeed, rumor had it that Foreign Minister Sazonov had resigned in indignation at Stürmer's ungenerous policy. Such was the situation when on Nov. 5, 1915, the German and Austrian emperors conjointly published a proclamation promising to create an independent Kingdom of Poland, "a national state with a hereditary monarchy and a constitutional government," in "intimate relations" with Austria-Hungary and Germany. Shortly afterwards Archduke Charles Stephen of Austria, a cousin of Francis Joseph, was appointed regent of Poland; presumably he was destined to become the first King of the new Poland. Although the exact frontiers of the new state were to be outlined later, a statement by the Prussian Minister of the Interior, November 20th, made it clear that no part of Prussian Poland was to be included, and a letter from the Austrian Emperor to the Austrian Premier promised Austrian Poland (Galicia) autonomy but not unification with independent Poland. With admirable tact, the Teutonic governments arranged to have the proclamation of Polish independence publicly read in Lublin and Warsaw in the Polish language, and followed by the hoisting of Polish flags while Teutonic military bands played the Polish national anthem. Elections were at once instituted for the State council or Upper House of the future Polish Parliament. The Polish Jews, moreover, were conciliated by the grant of special religious privileges. The principal purpose of this Austro-German magnanimity was shortly revealed, when proclamations were issued by Governor-General von Beseler at Warsaw and by General Kuk at Lublin exhorting the Poles to volunteer for service in the Polish army, which would join in the struggle against Russia. Russia, on the other hand, made haste to issue a counter-proclamation denouncing the German proclamation as illegal and insincere, threatening to treat as traitors rather than as prisoners of war any Russian

Poles captured from the new Polish army, and promising to create a unified and autonomous Poland on an ethnographical basis (which would mean including Prussian Poland and Galicia as well as Russian Poland), under the sovereignty of the Czar, after the war. The French and British premiers congratulated Russia upon her "generous initiative" and associated themselves with Russia's plans.

**DISCUSSION OF PEACE AND OF PEACE TERMS.** In the discussion of the possibility and the terms of peace, six features of the year's diplomacy stand out as of prime importance. (1) The Austro-Hungarian proclamation of a Polish kingdom (above) removed uncertainty regarding the intentions of the Central Powers in the matter of the territory conquered from Russia; at the same time it discredited rumors of a separate Russo-German peace, since the conflict was now brutally clear between the Teutonic determination to carve a pro-German Polish kingdom out of Russian territory and the Russian determination to annex Galicia and Prussian Poland to Russian Poland. Eleven days after the Teutonic promise to Poland, Russia issued a categorical denial of rumored secret negotiations with Germany. (2) Russian opposition to German aims was also clearly defined in respect of Constantinople. On December 3rd, the Russian Premier, M. Trepoff, revealed the fact that in March, 1915, at the time of the Anglo-French naval attack on the Dardanelles, the Entente Powers had definitely promised Constantinople to Russia. Inasmuch as the cession of Constantinople to Russia would completely destroy the German scheme of a Berlin-Constantinople-Bagdad railway, German publicists insisted upon the retention of Constantinople by Turkey. (3) The Entente Powers on February 14th formally pledged themselves not to make peace until Belgium was restored as an independent state; moreover, Belgium was guaranteed in possession of the Congo, April 29th. Such was the reply of the Allies to Bethmann-Hollweg's ambiguous pronouncement of Dec. 9, 1915, that Germany "must have military and political security" against the danger of Anglo-French attacks through Belgium. (4) In view of the Entente's oft-repeated demand of "security against future wars," Germany's qualified acceptance of the principle of a league of peace is decidedly worth noting. On April 5, 1916, the German Chancellor vaguely approved of the "peaceful arrangement of European questions after the war." But on Nov. 9, 1916, speaking more concretely of a league to enforce peace, Bethmann-Hollweg promised that "Germany will honestly cooperate in the examination of every endeavor to find a practical solution, and will collaborate for its possible realization. This all the more if the war, as we expect and trust, brings about political conditions that do full justice to the free development of all nations, of small as well as great nations. Then the principles of justice and free development, not only on the Continent, but *also upon the seas*, must be made valid. This, to be sure, Viscount Grey did not mention." "Germany is at all times ready to enter a league of peace which will restrain the disturber of peace."

(5) The debate between the German Chancellor and the Entente leaders on the question of concluding the war, culminating on the part of the Central Powers in a formal offer to begin peace negotiations, is well worth reproducing in

outline. On April 5th the German Chancellor predicted that Poland and the occupied portion of Lithuania would not be returned to Russia, and that "a new Belgium" must be created, in which the rights of the "oppressed Flemish race" would be respected; at the same time he declared that the sword was the only answer to the Allies' "claim of definitive and complete destruction of Prussia's military power." Mr. Asquith replied, April 10th, that the destruction of Prussian militarism meant not destroying Prussia, but establishing "the principle that international problems must be handled by free negotiation on equal terms between free peoples and that this settlement shall no longer be hampered or swayed by the overmastering dictation of a government controlled by a military caste." Sir Edward Grey reinforced Mr. Asquith's statement by reiterating that Belgium and Serbia must be restored and a "guarantee against aggressive war" obtained. On May 22nd, Bethmann-Hollweg retorted that the Allies rather than the Central Powers were guilty of militarism; that the Allies must "come down to a basis of real facts" and "take the war situation as every war map shows it to be." Again on June 5th, the German Chancellor announced that if the Allies persisted in shutting their eyes to the war map, "then we shall and must fight on to final victory." "We did what we could," he asserted, "to pave the way for peace, but our enemies repelled us with scorn. Consequently all further talk of peace initiated by us becomes futile and evil." Whereupon Lloyd George, in a letter of June 8th, wrote that "only a crushing military victory will bring the peace for which the Allies are fighting." Briand, the French Premier, likewise believed that peace "can only come out of our victory." By September 28th, the German Chancellor appeared to be fully convinced of the futility of peace proffers. Reminding the world that on Feb. 9, 1915, and on several subsequent occasions, he had declared Germany's readiness for peace negotiations, Bethmann-Hollweg blamed the Allies for desiring to conquer Constantinople, Alsace-Lorraine, Transylvania, and Trentino, and asked "Does any one dare to demand that we should make offers (of peace) in the face of Premier Briand's declaration that the conclusion of peace to-day would be a sign of weakness or a proof that memory was dead?" On the same day, September 28th, Mr. Lloyd George gave out an interview asserting that Great Britain would tolerate no outside intervention "until Prussian military despotism is broken beyond repair"; "the fight must be to a finish—to a knockout." A little later, on October 11th, Premier Asquith vigorously reiterated, "This war cannot be allowed to end in some patched-up, precarious, and dishonoring compromise masquerading under the name of peace."

In spite of repeated rebuffs, the Central Powers made yet another offer of peace negotiations, in December. Perhaps the purpose was to convince the clamorous German Socialist-Pacifists and the uneasy Hungarian politicians that the responsibility for prolonging the war rested upon the Entente rather than upon the Alliance; possibly the favorable effect of such an offer upon public opinion in neutral countries and upon popular sentiment in enemy countries was chiefly considered; or again, the Central Powers may have entertained the hope that if the Entente Powers

could be induced to negotiate their harmony might be destroyed and their resolution weakened. At any rate, on December 12th, Germany, Austria-Hungary, Bulgaria, and Turkey simultaneously submitted almost identical notes to the diplomatic representatives of Spain, Switzerland, and the United States, as well as to other neutral Powers and to the Vatican, proposing "to enter forthwith into peace negotiations." No concrete terms were offered by the Central Powers, but the Entente Allies were invited to enter into a discussion of "an appropriate basis for the establishment of a lasting peace," and apparently the intention was to hold *pourparlers* at The Hague during the winter, while hostilities continued. The notes were forwarded to the Entente Powers without comment by the neutral intermediaries. Immediately the Russian foreign minister, with the emphatic approval of the Duma, denounced the Teutonic peace offer and declared Russia's unwillingness to enter into any peace negotiations whatsoever. The Czar, in a proclamation to his armies, December 25th, declared that the "time has not yet arrived. The enemy has not yet been driven out of the provinces he has occupied. Russia's attainment of the tasks created by the war—regarding Constantinople and the Dardanelles, as well as the creation of a free Poland from all three of her incomplete racial districts—has not yet been guaranteed." Foreign Minister Sonnino of Italy and Premier Briand of France likewise disclaimed any intention of concluding a premature peace. In behalf of Great Britain, Mr. Lloyd George, who had but recently become Premier, declared on December 19th that while the Allies would wait to hear what terms Germany had to offer, little could be expected of peace negotiations at the present; "the very appeal for peace was delivered ostentatiously from the triumphal chariot of Prussian militarism." "It would be a cruel folly" not to stop Germany from "swash-buckling through the streets of Europe." As for the Allies' terms, the most precise announcement Lloyd George vouchsafed was "complete restitution, full reparation, and effectual guarantees."

(6) Within a week the Central Powers' peace offer was followed by an unexpected note from the United States to the belligerent nations, December 18th, setting forth a request that the warring governments avow "the precise objects which would, if attained, satisfy them and their people that the war had been fought out." Switzerland, Norway, Denmark, and Sweden officially expressed approval of this proposal. The note was not cordially received by the press of the Entente countries. Although Secretary Lansing took pains to explain that President Wilson's request was not suggested by the Central Powers, but was prompted by American altruism and American interests, the practical effect of the move was to support the Central Powers' plea for peace negotiations. Moreover, French and British newspapers took exception to President Wilson's statement that "the objects which the statesmen of the belligerents on both sides have in mind in this war are virtually the same, as stated in general terms to their own people and to the world. Each side desires to make the rights and privileges of weak peoples and small states as secure against aggression or denial in the future as the rights and privileges of the great and powerful states . . . each is

ready to consider the formation of a league of nations to insure peace and justice throughout the world."

In consequence of the peace overtures made by the Central Powers and by President Wilson, there seemed at the close of the year to be some prospect of a clearer statement of the issues for which the nations of Europe were ruthlessly sacrificing millions of men and billions of dollars. Regarding Alsace-Lorraine, to be sure, the issue was already clear: the French government had frankly announced its determination to reconquer these "lost provinces"; British cabinet officers had assented; but the German government could not be expected to yield unless in the extremity of bitter defeat.

The principal points at issue between Russia and the Central Powers, moreover, were tolerably well defined: Russia, with the approval of the other Entente Powers, had avowed the conquest of Constantinople, Prussian Poland, and Galicia as her unalterable aims; whereas the Central Powers wished to make Russian Poland independent and maintain Turkey in control of the Dardanelles. Japan's intention of appropriating the German leased territory of Kiaochow was avowed with equal candor. Uncertainty, however, still remained regarding Belgium, for while the Allies had solemnly pledged themselves to restore Belgium, they had never explicitly stated what they understood by Lloyd George's sonorous but cryptic phrase, "full reparation"; nor had Bethmann-Hollweg explained how a "new Belgium" was to be created which would live on friendly terms with Germany and respect the rights of the Flemish race. The restoration of Serbia had been demanded by the Allies less emphatically than the restoration of Belgium, and the Allies themselves, by urging Serbia to cede part of her Macedonian territory to Bulgaria, had given the world reason to believe that the ante-bellum boundaries of Serbia were not sacred. Rumania had come into the war for Transylvania, but in the face of Rumania's utter defeat (see below, IV, 20) would the Entente maintain Rumania's claim as one of the essential conditions of peace? As concerned Italy's aims, the Entente might reasonably be expected to insist upon the cession of the Trentino, Gorizia, and possibly Trieste and Avlona to Italy; but was the Italian's premier's statement to be literally fulfilled, that Austria-Hungary must be dismembered and the various subject nationalities be united to their brethren outside? The dismemberment of Turkey had been hinted at, but never explained in detail (aside from the question of Constantinople), as one of the Entente's objects. Nor had the British government ever formally renounced the conquest of the German colonies; in their war for the defense of small nations, would the Allies make this one of their conditions of peace? Most of all, neutral opinion was perplexed by the vagueness of the Allies in stating what they asserted to be their supreme purpose in the war, the destruction of Prussian military domination. Now that the German Chancellor had declared his willingness to consider a league to enforce peace, what further would the Allies demand? Disbandment or limitation of the German army or destruction of the German navy might be among the more obvious methods of destroying German militarism, but no such blunt statement of the Allies' intention had ever received official sanction. Nor, finally, had the Entente ever

formally stated whether it intended to enforce the popular demand of reparation, ship for ship, for every vessel sunk by German submarines. In the light of these unanswered but vitally important questions, the significance of President Wilson's initiative, and the response of the belligerent nations, may be more fully understood and appreciated.

**POPE BENEDICT XV AND PEACE OVERTURES.** Because of his unique international position, Pope Benedict XV was able to play a conspicuous rôle in advocating the speedy restoration of peace on a basis of mutual concession and justice. In a Lenten letter to Cardinal-Vicar Pomi, the Pope affirmed that "on several occasions" he had endeavored to "persuade the belligerent nations to lay down their arms and adjust their differences in a way compatible with human dignity, by means of an amicable agreement"; despite rebuffs, he could not "refrain from raising once again our voice against this war which appears to us as the suicide of civilized Europe"; and he urged all Christians to pray for peace and to give alms for the relief of war sufferers. In May, when a rupture between the United States and Germany seemed imminent (see UNITED STATES AND THE WAR), the Pope sent a special message to President Wilson. Although its purport was not made public, the note was popularly interpreted as an effort to prevent the United States from becoming embroiled in the terrible European conflict; in fact, it was asserted unofficially that the Pope had persuaded the German Emperor to return a conciliatory answer to President Wilson's peremptory "Sussex Note."

Later rumors suggested that the Pope had urged President Wilson to step forward as a peace-maker, and in confirmation of this view it was pointed out that shortly afterward, on June 2nd, the Papal Secretary of State declared that Benedict XV would welcome mediatory efforts on the part of Spain or of the United States. In his allocution to the consistory on December 4th, the Pope again raised his voice in behalf of peace and sternly denounced "the horrible madness of the conflict which is devastating Europe." "We behold," he said, "in one place the vile treatment inflicted on sacred things and on ministers of worship, ever of high dignity, although both the former and the latter should be inviolable by divine law and the law of nations; in another, numerous peaceful citizens taken away from their homes amid the tears of mothers, wives and children; in another, open cities and undefended populations made victims especially of aerial raids; everywhere on land and on sea such misdeeds perpetrated as fill the soul with horror and anguish." It will be noted that the Pope's words might be taken as a direct and vigorous rebuke to Germany for the Belgian deportations (see BELGIUM)—although neither Germany nor Belgium was specifically mentioned. Constantly endeavoring to alleviate the sufferings as well as to hasten the termination of the war, Benedict XV raised a Polish Relief Fund, appealed to the "children of America" to give generously for the relief of the children of Belgium, induced France and Germany to exchange crippled prisoners, and secured the liberation of the Belgian Catholic Labor leader, Arthur Verhaegen, who had been imprisoned by the German military administration.

## IV. MILITARY OPERATIONS

*(1) The Conquest of Montenegro.*

After the Austro-German-Bulgar armies under Field Marshal von Mackensen's able direction had completed their amazingly rapid conquest of Serbia (October–November, 1915) and driven the Anglo-French expeditionary force southward to Saloniki (December, 1915), it was a fairly easy task to overwhelm Montenegro's slender forces. Altogether the Montenegrin field army numbered less than 30,000 men. General von Koevess, who had been entrusted with an Austrian army for the conquest of Montenegro in December, 1915, quickly occupied the towns of Jakova, Ipek, Bielopolye, and Plevlie, on the eastern border of Montenegro; then, penetrating into the interior, the converging columns of his army defeated the Montenegrins in their last desperate stand in the Tara and Lim valleys, in January. Meanwhile another Austrian detachment, attacking the western frontier, from the Austrian harbor of Cattaro, built military roads up the northern slopes of the supposedly impregnable but really ill-fortified mountain stronghold of Lovtchen, around which wound the steep road to the capital, Cetinje, five miles distant. After three days' bombardment by the Austrian ships at Cattaro, Mount Lovtchen was stormed on January 10th. Lovtchen lost, the Montenegrins made no serious attempt to defend their capital, which fell three days later. News that the Montenegrin government had made terms, and that the army had laid down its arms, was flashed to the outside world by Austria-Hungary. A few days later, however, it appeared that the Montenegrins had refused to accept the terms offered by Koevess—which included the surrender of all arms—and that King Nicholas had fled to Italy, January 19th. The obstinacy of Montenegrin resistance delayed but could not prevent the complete subjugation of the country. The seat of the Montenegrin government was transferred to Lyons, France. Italy was much reprobed for having failed to succor Montenegro, especially since the Queen of Italy was a daughter of the unfortunate Montenegrin King. The most charitable explanation of Italy's seeming indifference to Montenegro's fate was that Austrian submarines lurking in the harbor of Cattaro would have rendered the transportation of Italian troops to Montenegro extremely hazardous.

*(2) The Invasion of Albania.*

The victorious columns of General von Koevess scarcely paused in their southward march; the 40 miles from the Montenegrin capital to the chief city of northern Albania, Scutari, were traversed in 10 days; the port of San Giovanni di Medua fell on January 25th; and early in February the invaders reached the heights of Tirana, in central Albania, 10 or 15 miles inland from Durazzo. In the meantime Bulgar forces had crossed into Albania from Serbia and occupied El Bassan, according to current reports, on February 12th. Essad Pasha, chief of the provisional government of Albania, offered but feeble resistance to the invasion. An Italian contingent, which had been stationed in Durazzo since December with the object of safeguarding the escape of Serbian fugitives (100,000 or more Serbians were transported to Corfu and there reorganized into a fighting force, to be

transported subsequently to Saloniki), evacuated the city in February, under fire of Austrian and Bulgarian guns. The larger Italian army at Avlona, sixty miles south of Durazzo, was not withdrawn, but reinforced, so that from Avlona as a base the Italians were able to dominate southern Albania, while the northern and western portions of the country remained in Austro-Bulgar possession. (See below, IV, 19.)

*(3) Russia's Winter Offensive.*

The price of the Austro-German victories in the Balkans was paid by the Austro-German armies on the Russian front, which had been weakened in order to supply effectives for Field Marshal von Mackensen's smashing offensive in Serbia. Having conquered Russian Poland, Courland, Kovno, Vilna, Grodno, and western Volhynia in a single brilliant campaign of three months' duration (July–September, 1915, see YEAR BOOK for 1915, pp. 713–714, 722), the Teutonic armies in the East had suddenly halted in their march and allowed the demoralized Russian army to reform its lines and to regain its courage. After a few feeble attempts to capture the Baltic port of Riga, Field Marshal von Hindenburg, who commanded the northern half of the Teutonic front, was content during the winter to rest on the defensive and even suffered his lines to be pushed back a few miles in the region of Lake Sventen, directly west of Dvinsk. Prince Leopold's army, which had been picking its way through the marshes of the Pripet River, was now reduced to a single army corps and had difficulty holding Pinak. Linsingen and Archduke Ferdinand, holding the line from Volhynia to the Bukowina, were obviously weaker than their opponent, Ivanov, and maintained their position along the valleys of the Stry, the Strypa, and the Dniester only by virtue of carefully prepared intrenchments, plentiful machine guns, concrete shelters, wire entanglements, and superior artillery. Altogether, the Austro-German strength on the Russian front could not have exceeded 2,500,000. The Russian line, already superior in numerical strength, was being rapidly reinforced by new recruits—War Minister Polivanov officially stated that Russia was able to maintain a fixed reserve of 1,500,000 men in training—equipped with Japanese rifles, and supplied with imported munitions. Three months of German inactivity (October–December, 1915) enabled Russia to recuperate so rapidly that by Christmas Eve, 1915, General Ivanov was prepared to inaugurate a general offensive on the southern 200 miles of the front.

The purpose of Ivanov's offensive was primarily political. As it was at this time still uncertain whether Rumania would throw her forces into the scale on the side of the Entente or on the side of the Alliance, a Russian victory in the region immediately north of Rumania might have a decisive influence, counteracting the effect of the Allies' reverses in Serbia and on Gallipoli (see YEAR BOOK for 1915, p. 719). At any rate, Rumania would be deterred from joining the Central Powers until the result of the new Russian offensive could be judged. With Rumania in mind, Ivanov concentrated his attention chiefly on Czernowitz, the capital of the Bukowina, just north of Rumania. As the Russian lines lay only 15 miles from the city, it seemed as if an important success could be











achieved in this sector at the smallest cost. Accordingly General Lechitaky, acting under Ivanov's direction, stormed the low wooded ridge just north of Czernowitz, December 28th, and brought the city itself under long-range fire. The Croat and Magyar defenders of Czernowitz, however, displayed unexpected valor; snow impeded infantry maneuvers; and after three weeks of vain endeavor Lechitaky abandoned the attack, about January 18th. The demonstration against Czernowitz had cost Russia about 60,000 men. In a military sense, it had been a costly failure; but it had prevented the Central Powers from persuading or constraining Rumania to join them, and it had induced the German General Staff to transfer Mackensen with five divisions back to the Russian front, thus relieving the pressure in the Balkans. Several minor aspects of Ivanov's offensive merit brief notice. While delivering his main blow at Czernowitz, the Russian commander had also engaged the German General von Bothmer at the railway crossing of Buczacz on the Strypa, 50 miles north of Czernowitz; still further north a Russian column had moved menacingly along the railway from Rovno toward Lutsk; and on Ivanov's extreme northern wing General Brusilov had forced the passage of the Styr in the neighborhood of the Sarny-Kovel Railway and had captured from General von Linsingen the towns of Kolki, Khriaak, and Chartoryak, in the first week of January. (See below, IV, 7.)

#### (4) *The Fall of Erzerum.*

A more successful Russian offensive was conducted in Armenia during January and February by Grand Duke Nicholas Nicholaevitch, the former commander in chief, who had been transferred to the Caucasus in September, 1915. Marshaling an army of 180,000 men against 150,000 Turks, the Grand Duke had been preparing for an advance in the spring, but when the Anglo-French forces evacuated the Dardanelles, January 9th, releasing 200,000 or more Turks for service in Asia Minor, he was forced to strike at once, before the Turks in Armenia could receive reinforcements. The very unexpected character of the attack, in the dead of winter, with roads blocked by snow and the thermometer registering from 20 to 40 degrees below zero, may account for the ease with which the unsuspecting Turks were routed. Under the actual command of General Yudenitch, who was entrusted with the execution of the Grand Duke's design, the Russian columns advanced westward from the Russo-Turkish frontier and about January 11th began their march through the bleak mountain passes leading into Turkish Armenia. The northern column isolated one Turkish corps and drove it pell-mell northwards; the southern column cut off two divisions from the main Turkish army; while the central column, following the highway from Sarikamish toward Erzerum, inflicted a crushing defeat on three Turkish divisions at Kuprikeui (33 miles east of Erzerum), January 16th-18th, and forced the crossing of the Araxes River in the midst of a blinding snow-storm. Ruthlessly pursued by Cossack cavalry, the Turkish infantry retired in disorder, strewing the road from Kuprikeui to Erzerum with discarded rifles, abandoned cannon, and half-frozen stragglers. Against Erzerum, reputed to be the strongest fortified city in Asiatic Turkey,

General Yudenitch now massed his heavy artillery. By a brilliant feat of arms a Siberian division planted its 8-inch guns on supposedly inaccessible peaks commanding the northernmost of Erzerum's many outlying forts. The fortified ridge just to the east of the city was thus outflanked and successfully stormed. Without waiting to test the antiquated inner circle of forts and ramparts, the German staff officers and the Turkish garrison precipitately evacuated Erzerum, February 16th, leaving 323 guns and a huge stock of military supplies to fall into the hands of the Russians. Only a small part of the garrison—less than 13,000 men—was captured; though the total Turkish casualties in the entire campaign were estimated at 60,000. The fall of Erzerum did not open the way to Constantinople—or to Bagdad, either, for that matter—as some of the newspapers too excitedly declared; it did, however, help to restore the Entente's prestige in the Near East; it delivered the best part of Turkish Armenia into Russian possession; and it will be recognized as a brilliant piece of strategy. Nevertheless, it must be considered that had Russia devoted her energy exclusively to the European battle-front, Czernowitz might conceivably have been captured in January, and Rumania induced to cooperate in the great Russian offensive of June, 1916, which might in that case have been infinitely more successful. (See below, IV, 14.)

#### (5) *First Battle of Verdun (February).*

In the scheme of a victorious German war against France and Russia, as outlined by General Bernhardt and as conceived, presumably, by the German general staff, the necessity had been emphasized of crushing France first and then turning at leisure to defeat slow-moving Russia. But France had not been crushed, in 1914. The ever-memorable battle of the Marne had saved her field army, her capital, and her most important fortresses—Verdun, Toul, Epinal, and Belfort. Unconquered and undaunted, France remained in 1915 and 1916 the very soul of the Entente. After a year and a half of the war Russia was cast down by defeat and by revelations of scandalous inefficiency and corruption—not to say treachery—among her generals and her bureaucrats; England was still so half-hearted that even partial conscription could be seriously opposed in the House of Commons; Italy had entered the war haltingly, fought lamely, and might be expected to limp off the battle field if given half a chance; Serbia and Belgium had been virtually wiped off the map; but in France the will to conquer seemed invincible. If by a final, irresistible blow, France could be convinced that further sacrifices for the recovery of Alsace-Lorraine would be futile, would not a victorious peace then be in sight for Germany?

If this train of thought had not of itself been sufficiently cogent to convince the German general staff of the necessity of a new offensive against France, the preparations which General Joffre was pushing forward for a great Anglo-French drive would have been reason enough for a German attack on Verdun in February. France was training her classes of 1916 and 1917, according to War Minister Gallieni's own statement, in preparation for "the moment when the intensive production of armaments and of mu-

nitions, together with the reinforcement of the battle line with new masses of men, may permit new and decisive efforts." Great Britain (q.v.), thanks to the Derby recruiting campaign and the January Compulsion bill (for single men), might be expected to throw another million of men into France in the spring, and her 2000 government-controlled factories were already producing tremendous and ever-increasing supplies of munitions. The expected Anglo-French offensive of 1916 would be of unprecedented power; furthermore, if Russia and Italy should attack simultaneously, Falkenhayn would then be unable to transfer troops to France without inviting disaster on the other fronts. Therefore it was imperative to forestall the Anglo-French offensive and if possible to force Joffre to throw his half-trained reserves into the battle-line prematurely.

Strategic, economic, and political considerations pointed to Verdun as the natural objective of a German attack. To be sure, the concrete-and-steel forts and the disappearing armored turrets upon which French military engineers had prided themselves before the war were no longer considered of great military value, since 13-inch howitzers had demonstrated the frailty of fortifications in Belgium. But the strategic importance of Verdun lay less in its fortifications than in its position. The army that possessed Verdun possessed the Heights of the Meuse, a plateau or ridge some five miles broad extending north and south like a natural palisade, just east of the Meuse River, on which Verdun is situated. Their position on the Heights of the Meuse would be of inestimable advantage to the French when the time came for an attempt to reconquer Lorraine; impetuously descending down the slopes to push the Germans back across the plain of the Woivre, to the eastward, the French troops would be supported by heavy artillery mounted on hilltops 500 feet or more above the floor of the plain, while the Germans would find it extremely difficult to emplace their heavy artillery on the clayey soil of the Woivre. Should the French lose the Heights of the Meuse, not only would a French attack on Lorraine be out of the question, but for defensive purposes no new line could be found of such great natural strength. The economic reason for the German attack on Verdun was usually ignored by military critics, but it was none the less vital; a glance at any industrial map of France will show that northeast of Verdun, toward the German border, are situated immensely valuable iron mines; a successful French offensive in that direction, especially if it attained the adjacent mining region of German Lorraine, would cripple Germany by depriving her of one of the chief sources whence the material of munitions had been drawn during the war. Finally, the political considerations which may have recommended a German drive at Verdun may be stated briefly: first, if France lost Verdun and the Heights of the Meuse French patriots would lose hope of realizing their chief object in the war—the reconquest of Alsace-Lorraine—and might consent to make peace; second, inasmuch as the German Crown Prince commanded the Verdun sector, a victory there would enhance the prestige of the heir to the imperial throne; third, the discontented elements in the Reichstag, particularly the Conservatives and National Liberals, who were bitterly criticizing Bethmann-Hollweg for his ten-

dency to yield to American remonstrances against ruthless submarine warfare, might be silenced by a great success like the capture of Verdun.

Every effort was made to disguise the German preparations for the intended move against Verdun. During January and February, while army corps after army corps was quietly taking its place in the Crown Prince's lines, while hundreds of 4-inch, 7-inch, 13-inch, and even 17-inch guns (according to the London *Times History of the War*) were being massed north of Verdun in the forest of Forges, Consevoye, Spincourt, and Gremilly, feints were being made against a dozen other sectors of the Anglo-French line. An attack against Nieuport, January 24th, and rumors of troop movements through Belgium, seemed to preclude a new drive toward Calais; on the Somme, the village of Frise was captured by the Germans; in Artois, on the bitterly contested slopes of Vimy Ridge, the Crown Prince of Bavaria delivered a violent attack against the French line on January 23rd and continued his efforts, with daily mine-explosions and infantry assaults, until the middle of February; at the extreme southern end of the Western front, the French lines southwest of Altkirch (in southern Alsace) were assailed and 15-inch shells began to drop into the French fortress of Belfort like heralds of an approaching storm. Nevertheless, while it still remained uncertain from what quarter the Germans would attack, Joffre sent six divisions of infantry and six of heavy artillery to reinforce the garrison of Verdun, in the week of February 11th-17th. Just as the battle was about to begin, the French made hasty efforts to put in fighting trim the elaborate intrenchments which General Sarraill had constructed in 1914, when profiting by the example of Liège and Namur he had learned to put his faith in trenches rather than in the redoubts and forts (36 in all) which bristled on every hilltop for five miles around Verdun. Meanwhile the Crown Prince had concentrated 14 German divisions against 3 French on a 7-mile sector from Brabant to Herbebois, where the outlying French trenches were about 8½ miles north of Verdun. All was ready for the great effort.

A terrific bombardment preceded the first attack, on February 21st. Never had artillery fire been of such withering intensity. High explosive shells of every calibre, from 4 to 14 inches, fairly obliterated the French first-line trenches. Groves which might have afforded shelter to French artillery were wiped out of existence, trees being uprooted and shattered into splinters. Under the terrible hail of fire, the French soldiers with their machine-guns and "75s"—those that escaped destruction—waited with grim determination to make the German infantry pay heavily for its advance. But the Germans did not intend to sacrifice their men needlessly. No advance was attempted until scouts and sappers had cautiously stolen forward to make sure that the bombardment had thoroughly accomplished its work of destruction. Then, while the German guns lengthened their range, so as to place a "curtain of fire" in the rear of the French trenches, cutting off supplies and reinforcements, the German infantry would be able with comparative safety to occupy the ruined French first line. Step by step the German howitzers would blast their way into Verdun; there would be no need of reckless infantry charges.



**GENERAL ROBERT NIVELLE**



**GENERAL FERDINAND FOCH**



**GENERAL SIR DOUGLAS HAIG, G.B.C.**



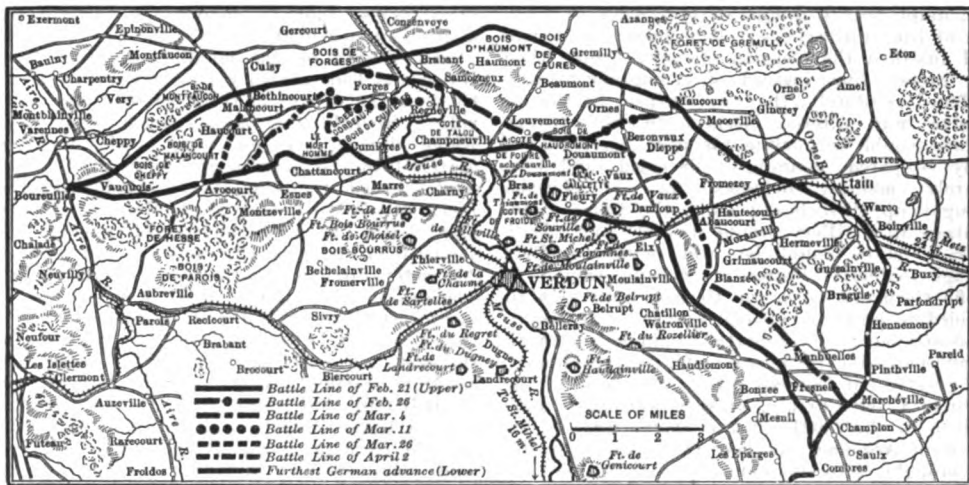
**GENERAL A. BRUSILOV**

**GENERALS OF THE ALLIED ARMIES**



At first the German offensive proceeded with the mechanical regularity of clockwork. The first line of French trenches, demolished by the preliminary bombardment, were easily occupied by German infantry during the evening of February 21st, on a three-mile front extending through the Bois d'Haumont (Haumont Wood), the Bois des Caures, and Herbebois, northeast of Verdun on the hilly right bank of the Meuse. Next day, the southern fringes of Haumont Wood and Caures Wood were cleared and the village of Haumont, heroically defended by Colonel Driant's chasseurs even after it had been leveled to the ground by German artillery, was carried by storm. Brabant was evacuated that night. French counter-attacks proved unavailing against the enormous odds. A third day of furious bombardment—this time accompanied by a more prodigal use of infantry—brought the Germans into Samogneux, Beaumont, and Ornes. On the following night (February 24th), while swirling clouds of snow concealed their movements, the exhausted and decimated defenders of Verdun wearily plodded back to

of the German onslaught, Verdun's fate would be almost certain. But French reinforcements, which had been withheld until Joffre was sure the Verdun attack was not simply another feint, arrived just in time, and with them arrived General Pétain, on the very day of Fort de Douaumont's fall. Pétain infused new energy into the demoralized defense. He had already proven his fighting temper in the battle of Artois (spring and summer of 1915) and in the Champagne offensive (September, 1915); before the war he had been an inconspicuous colonel, one of the many Catholic army officers who could scarce hope for promotion while anti-clerical politics held sway in the army; in actual warfare, however, his ability could not be ignored and he had speedily won the rank of general and the reputation of being one of Joffre's most brilliant subordinates. On February 26th, the morning after his arrival, Pétain ordered a counter-attack. By an impetuous charge the Twentieth Corps swept the Germans back down the hillside, and although a Brandenburg regiment remained ensconced in Fort de Douaumont,



BATTLE LINES AROUND VERDUN

strongly prepared positions on the Côte du Poivre (Pepper Hill) and the hill-plateau of Douaumont—the former 347 meters in height, the latter 388. In four days the Germans had battered their way over four miles, until at Douaumont they reached the first of the outlying permanent forts of Verdun. Eighteen German divisions were massed on a front of four and one-half miles, from Pepper Hill to Hardaumont. All during the day of February 25th the German infantry, wave upon wave, surged up the snow-covered slopes of the Douaumont plateau, only to recede under the murderous fire of French mitrailleuses and 75-millimeter guns. Towards evening, a supreme assault, viewed from a distant hill by the Emperor himself, carried Fort de Douaumont. The fort itself was a crumbling heap of ruins, but the hilltop (388 meters high) on which it was situated overlooked all the surrounding country and commanded a clear view of Verdun, less than five miles to the southwest. If the French could be hurled back from this their strongest natural position, before heavy reinforcements arrived, and while the defense was still suffering from the initial shock

possession of the fort was useless without command of the approaches and communicating trenches. For four days the battle raged incessantly about the fort and village of Douaumont until on the evening of February 29th and during the day of March 1st the German attack slackened. That brief lull marked the passing of the crisis. The impact of the German drive had been broken before a real breach had been made in the vital defenses of Verdun; the French had recovered from their surprise, and now with the heavy reinforcements and ample supplies which an endless train of motor lorries was ceaselessly pouring into Verdun, they were ready to dispute every inch of ground.

During the first phase of the battle, from February 21st to February 29th, the brunt of the German drive had been borne by the French lines on the Heights of the Meuse, where the Germans had battered their way over four miles from the Brabant-Ornes position southward to the Pepper Hill-Douaumont position. Even more ground had been gained, but at smaller cost, in the Woevre plain, directly east of Verdun, where on February 24th-25th the French

outposts had been pushed back six miles from Etain to Eix and the Germans had occupied Dieppe, Fromezey, Abaucourt, Moranville, and Blanzée. The new French line was drawn close to the edge of the plain, in front of the Heights of the Meuse. At Eix, at Manheuilles, and at Fresnes (held by the French until March 1st) the French resisted further pressure.

(6) *Verdun: Second Phase (March-April).*

In continuing the battle of Verdun beyond the first phase, the German general staff seems to have been swayed by political and sentimental rather than by military motives, just as at the beginning of the war French sentiment had demanded the imprudent invasion of the "lost provinces." Had General Pétain failed to stem the tide at Douaumont on February 26th, the German Crown Prince might well have achieved the brilliant feat of conquering Verdun in a fortnight; France might have been disheartened; possibly the war might have been concluded. During the first nine days of the Verdun battle, while there was still hope of achieving so great a triumph with a comparatively moderate sacrifice of life, military as well as political wisdom had justified the German offensive. But when the French line, instead of crumbling fatally, stiffened resolutely, the whole aspect of the offensive was altered. Henceforth the Crown Prince would be hurling his men against carefully prepared, cunningly concealed, and adequately manned defenses. As the French brought up their heavy guns, the German advantage in artillery would dwindle and disappear. Victory could be won neither swiftly enough to terrify France nor cheaply enough to profit Germany. Yet the German general staff decided to purchase victory, cost what it might. Discontinuance of the battle would be a humiliating confession of defeat and a severe blow to the prestige of German arms; the name of the German Crown Prince, already associated with failure in the battle of the Marne and in the battle of Argonne (see last YEAR BOOK), would be brought into disrepute; and the political situation of the German government would be extremely embarrassing as it attempted to face the scathing criticism of the Tirpitz party, which continued to demand ruthless submarine warfare, and the bitter complaints of the Socialists, who voiced the desire of the masses for food and for peace (see GERMANY). The battle, therefore, must continue.

In the second phase of the battle of Verdun, interest shifts to the left bank of the Meuse. Prior to March 1st, there had been little fighting except on the narrow front, six or seven miles in length, where the French line straddled the Heights of the Meuse, north of Verdun; the 12-mile sector east of the Heights of the Meuse had been flattened against the Heights, almost without resistance; but west of the Meuse only artillery had been active. Owing to the fact that the hills west of the Meuse were much less imposing than those on the other bank—for example, Dead Man's Hill, the key of the situation on the western bank, was 280 feet lower than Douaumont—an advance there would be easier than east of the Meuse; furthermore, it seemed imperatively necessary to push the line west of the Meuse at least as far south as the line east of the river, since the French guns on

the hills west of the Meuse were now in a position to rake the German line on the opposite bank from the flank and rear and by their fire prevent an effective assault on Pepper Hill. If the Crown Prince was to turn the Douaumont position by storming Pepper Hill, the menace from across the Meuse must be removed. Mr. Hilaire Belloc vouches for the statement that the 12 420-millimeter howitzers employed against the Heights of the Meuse in the first phase of the battle were allowed to remain east of the Meuse, ominously pointed toward Douaumont and Vaux; hence it may be inferred that the Crown Prince still regarded the Heights of the Meuse as the principal obstacle, the battle west of the river being merely a subsidiary feature.

On March 2nd the booming of heavy German artillery in the woods near Forges and north of Dead Man's Hill apprised General Pétain of the German decision to attack west of the Meuse. After four days' intense bombardment, two divisions of German infantry stormed Forges village, flung themselves across the Forges brook (which falls into the Meuse opposite Brabant), and charged up the forested ridge known as Côte de l'Oie (Goose Ridge). Before nightfall the Germans had penetrated the Bois des Corbeaux (Crow Wood) on the northern slope of Goose Ridge and had carried the village of Regnéville, between the Meuse and the eastern tip of the ridge. Bitterly the battle raged about Goose Ridge during the following week, until on March 14th the German attack swerved further west against the key of the whole situation, Dead Man's Hill. Le Mort Homme or Dead Man's Hill is a double-crested mound (the northern crest is usually indicated on maps as 265-meter hill, the southern as 295-meter hill) overlooking the village of Béthincourt to the northwest, Crow Wood and Cumières Wood to the northeast, Cumières and Chattancourt on the east, and Enes on the south. To the west, Le Mort Homme is overtopped by Hill 304 and by Hill 310; but if Le Mort Homme could be carried, Goose Ridge would no longer be tenable, and the Germans could advance along the riverbank past Cumières and Chattancourt, screened by Dead Man's Hill to the westward. On March 14th, some 25,000 Germans, advancing in five successive waves, surged past Béthincourt and up the slopes of Le Mort Homme until the northern or lesser crest (Hill 265) was attained. German bulletins, exaggerating the victory, claimed that Le Mort Homme had been stormed; but in reality the higher summit was still held by Pétain's undaunted men, and the frontal attack on Le Mort Homme had been only half-successful. Again the Crown Prince shifted his forces westward, and on March 20th Bavarian infantry began to fight their way westward through Avocourt Wood, whence they hoped to advance up the gentle western slopes of Hill 304, which might be called the key of Le Mort Homme in the same sense that the latter was the key of Goose Ridge. The centre of the Verdun battle had been constantly veering westward. In order to flank Douaumont plateau, the Crown Prince needed to storm Pepper Ridge, to the westward; in order to storm Pepper Ridge, he needed to clear Goose Ridge, west of the Meuse; in order to clear Goose Ridge, he had to carry Le Mort Homme; in order to carry Le Mort Homme, he shifted his attack still further west against Hill 304. A 12-day battle west of

Hill 304 delivered Malancourt and Haucourt (April 1st) to the Germans, but the French tenaciously clung to the all-important hill. From March 17th to April 8th, the German advance amounted to one mile on a six-mile front. Still doggedly determined to conquer at any cost, the Crown Prince exhausted nine infantry divisions in a ferocious assault against the whole French line west of the Meuse, from Avo-court to Crow Wood, April 9th-10th-11th. Yet in spite of the frightful carnage, Hill 304 and Le Mort Homme could not be conquered.

East of the Meuse, likewise, the Germans during March and April expended their strength in heroic efforts, but without gaining a decisive advantage. After the brief pause of February 29th-March 1st, the struggle for the Douaumont plateau had been resumed with intense violence. The ruined hamlet of Douaumont, just below the fortified crest of the hill, was entered by the Germans on March 2nd, regained by the French the next day, and reentered by the Germans on the 4th. A little more than a mile southeast of Fort de Douaumont lay the village of Vaux, in a snug little hollow, with Fort de Vaux half a mile further south, on a hilltop considerably lower than Fort de Douaumont. From Douaumont, the Germans turned their guns against Vaux. On March 8th the German infantry fought their way into the village, only to be promptly expelled by French bayonets; a German official bulletin describing this engagement announced that the armored fort of Vaux and several other fortifications had been stormed; subsequent events lead us to believe that the bulletin was prophetic rather than veracious. On March 10th-11th the Germans redoubled their efforts, but although they gained a footing in the village, their intrepid charges up the steep slope before Fort de Vaux came to grief in the wire-entanglements at the crest. New assaults on March 16th, under cover of darkness, were discovered by French searchlights and frustrated. After a fortnight's rest, the attack was renewed. This time the Germans sent an entire division to fight its way up the narrow "ravine of death," past Vaux village, past Vaux Pond, and to scramble up over the rim of the Douaumont plateau (which forms the northern slope of the Vaux Ravine) through the Wood of la Caillette. The attack succeeded, but the corpses lying thick in gruesome heaps on the ground the Germans had won had barely grown cold before a French counter-attack thrust the Germans back almost to their old position. While both sides lay exhausted in the region of Vaux and Douaumont, the Germans with indefatigable energy prepared to attack in a new quarter; the German howitzers hurled their high-explosive shells on Pepper Ridge (Côte du Poivre) until it seemed that the French trenches must be annihilated; then confidently on April 18th 12 German regiments made the attack; but from the shattered French trenches the machine-guns spoke with so deadly an effect that the Germans recoiled in dismay.

The repulse at Pepper Ridge on April 18th and at Le Mort Homme on April 9th-11th concluded the second phase of the great battle for Verdun. French and British military critics already announced "the battle of Verdun is won." True, throughout April and May each daily bulletin gave news of a mine exploded, a gas-attack resisted, a trench gained by the use of jets of

liquid fire, a clash of grenadiers, or a duel of artillery; some of the most sanguinary conflicts of the whole war were still to take place at Verdun; but having tested the French line on both sides of the Meuse, the Germans at last knew that Verdun could not be gained by a few sledge-hammer blows, and henceforth they fought not with the confident expectation of victory, but rather with the fury of baffled but indomitable determination. According to the most conservative English estimates, Germany had sacrificed 200,000 of her best troops, as compared with 100,000 French casualties; even German estimates admitted huge losses, while alleging the French casualties to be larger still. In the face of these figures it would be absurd to maintain that the German offensive had succeeded; surely 120 square miles of French territory were not worth 200,000 men. The Crown Prince had played for higher stakes, and lost. The great plan to take Verdun by surprise, to strike consternation into the heart of the French nation, to forestall an Anglo-French offensive, had obviously failed. Pétain's holding battle at Verdun may well rank with Joffre's holding battle at the Marne as one of the decisive conflicts of the war. (See below, IV, 10.)

#### (7) *The Russian Diversion (March).*

While France was heroically bearing the brunt of the Verdun offensive, Russia came to the aid of her ally by attacking the German lines in the East. The lake region south of Dvinsk was chosen as the theatre of the Russian attack, possibly because the Russian positions in this region were unfavorably situated and, in many places, would be flooded by the spring thaw. On March 17th the Russians opened a heavy fire on the German positions in the Disna valley, about half way between Lake Driswiaty on the north and Lake Naroch on the south, and some 40 miles south of Dvinsk. Confident that the bombardment had annihilated the German machine-gun shelters and artillery parks, the Russian infantry rushed forward in mass formation on March 18th; but the German machine-guns had not been put out of action; and the Russians were mowed down by thousands. The Russians renewed their attacks more cautiously during the succeeding weeks and stormed the village of Velikieselo, just east of Tveretch (which lies on the Disna, a few miles south of Viday). Less sanguinary battles were fought in the neighborhood of Lake Naroch (75 miles south of Dvinsk), Postavy (50 miles south of Dvinsk), Driswiaty (20 miles south of Dvinsk), and Illukat (12 miles northwest of Dvinsk). Still further north, a determined attempt was made to push von Hindenburg back from the Dvina River line at Jakobstadt. Also, in the extreme south, in Galicia, the Dniester bridgehead at Uscieszko was stormed, March 19th. According to a German official statement, the Russians employed 500,000 men in their attack on the northern sector, and lost at least 140,000 in the 10 days March 18th-28th. In April the Russians suffered several sharp local defeats at the hands of Hindenburg, and the Russian offensive suddenly expired—a costly failure, if we may accept the German statement; a comparatively unimportant maneuver for better positions, if we may believe Mr. Belloc. If, however, it prevented the Germans from sending additional

reënforcements to Verdun from the East, the Russian diversion was not without importance. (See below, IV, 11.)

(8) *The Allies' War Council.*

For the Entente Allies victory was contingent upon unity. If the British government could nerve itself to adopt general conscription, if France could continue her unstinted sacrifices, if Italy and Russia could be supplied with ample munitions and artillery, the Central Powers would soon be outmatched on every front. Even then, however, the Central Powers would enjoy an immense, perhaps a decisive, advantage. Thanks to an admirable network of strategic railways, they could at will shift troops and artillery from one front to another, and since German staff officers advised and practically dominated the general staffs of Austria-Hungary, Bulgaria, and Turkey, the whole surplus force of the Central Powers might be utilized as a sort of human battering ram, with which staggering blows could be dealt first to one enemy, then to another, as the German general staff directed. Even though the aggregate forces of the Entente might exceed the aggregate forces of the Central Powers, the Central Powers might still be able to win the war by battering-ram tactics; in order to deliver a decisive blow against one antagonist, the Central Powers might have to weaken all other fronts to such an extent that the thinly held lines would be forced back a few miles here and there; but the one important victory would more than outweigh the smaller losses; in other words, if the Germans were able to muster a 50 per cent superiority in men and artillery on one front, say against Rumania, while on five other fronts they were 10 per cent inferior to their antagonists, the gains of the Germans in Rumania would be far greater than the sum of the losses on the other fronts, since under the conditions of modern trench-warfare a very large numerical superiority is required to make any impression upon the enemy's entrenched lines. Hence it was supremely necessary for the Allies to draw together in so close a military agreement, that for the Entente there would be, in Briand's words, "unity of front"; whenever the German battering-ram was turned toward any vital portion of the Allied front, the Allies must meet it with an equal show of force; the Entente must not repeat its blunder of October, 1915—the blunder of permitting the Central Powers to gain Bulgaria's alliance and to open the road to Constantinople, simply because Italy, France, and England refused to give Serbia any substantial assistance in defending the wedge between Bulgaria and Austria-Hungary. Nor must the Allies waste their resources in isolated, futile, uncoordinated "offensives," such as the Anglo-French "forward movement" of September–October, 1915, and the disastrous British expedition in Mesopotamia; the Allies' separate offensives must follow a prearranged time schedule so that the Central Powers would be unable to meet each offensive separately by shifting troops back and forth from one front to another.

Because it recognized the necessity and sought to provide for the practice of such "unity of front," the War Council of the Entente Allies at Paris on March 27th–28th marks the begin-

ning of a new phase of the war. The far-reaching effect of the council was seen not only in the dismissal of inefficient war ministers in Italy and Russia (see above, III, *The War Council at Paris*); not only in the adoption of conscription in Great Britain (q.v.); but also in remarkable manifestations of the Entente's military solidarity. Russian troops arrived in France, to help hold the Champagne line; Belgian armored-motor-car units were sent to Russia; Russia, France, Great Britain, Italy, Serbia, and even Albania contributed to enlarge General Sarrail's "international army" at Saloniki. When, in May, the Central Powers launched a terrific offensive against Italy (see below), Italy was not left to her fate as Serbia had been, but was saved by a powerful Russian attack on Austria (June), which compelled Austria to transfer a large part of her forces from the Italian to the Russian front. Moreover, the offensives which the Allies attempted in the summer of 1916 were nicely timed: Russia opened the attack early in June while Austria was busy with Italy, and Germany with Verdun; Italy followed three weeks later and continued to bear heavily on the Isonzo front; Sarrail in Macedonia ostentatiously began an "offensive" the purpose of which was to prevent Bulgaria from lending aid to Austria-Hungary; and just at the moment when the Russian drive was reaching its climax, and when presumably the Germans would be rushing all possible troops to the Russian front, a combined Anglo-French drive, of very formidable proportions, was begun in France (July 1st). One of Joffre's orders of the day plainly intimated that this schedule of successive attacks had been prepared by the War Council in March. The scheme did not secure a complete triumph for the Entente, but at least it enabled Russia, Italy, and France to achieve a very considerable measure of success; Rumania was at last convinced of the Entente's superiority and induced to enter the war in August; and from June to November the Central Empires were forced to stand on the defensive on every front (except the unimportant Turco-Persian front). The German "battering-ram" could not be used until the exhaustion of Russia's munitions relieved the pressure of the concerted Allied offensive.

(9) *The Austrian Invasion of Italy (May–June).*

The Austrian offensive against Italy in May was a shrewd, but only partially successful, endeavor to cripple the Italian army before the Allies' plans for a concerted summer offensive on all fronts had reached maturity. It was common knowledge that Cadorna was busily preparing reserve troops and munitions for the great events of the summer; if he could be compelled to exhaust these reserves prematurely, or if Northern Italy could be successfully invaded, Italy might be virtually eliminated from the war for the remainder of the year. With this purpose, the Austrian chief of staff, Hoetzendorf, began in April to mass enormous forces in the lower Tyrol for an offensive in the Trentino. That the Austrian attack should be delivered in the difficult mountain-country of the Trentino, rather than in the Isonzo River valley, was explained by two considerations: first, that on the Trentino front the Italian line was less strongly held and less carefully entrenched; second, that whereas an offensive on the Isonzo, even if suc-



cessful, would only drive the main Italian army back into Italian territory, a successful drive south from the Trentino, rapidly advancing into the Venetian plain, might cut the communications and possibly compel the capitulation of the Italian army of the Isonzo.

Up to May, 1916, there had been no really strenuous fighting in the Trentino. Comparatively small detachments of Italian Alpini had penetrated a little way into the inhospitable uplands of the western Trentino border through several mountain passes; one of the most striking incidents on this sector had been the conquest of the Adamello Glacier by a few thousand white-clad Alpini, April 11th–May 13th. In southern Trentino, the Italians had progressed 15 miles up the Adige River (Val Lagarina) to the outskirts of Rovereto, about half way from the frontier to Trent. In the eastern Trentino, the Italian line crossed the Val Terragnolo and the Val d'Astico not far from the frontier, then cut more deeply into Austrian territory west of Borgo, in the Val Sugana. The Italian line was hardly more than a broken series of detached outposts pushed unsystematically into the enemy's country; for defensive purposes it was dangerously weak; the exposed salient southeast of Rovereto might easily be crushed between attacks from the west and north; no good second-line position had been prepared; and some portions of the front were poorly munitioned, since supply trains threading their way along mountain defiles were quite frequently destroyed by avalanches (in some regions all supplies had to be forwarded by means of aerial cars suspended from cables). Gravest of all was the shortage of artillery, a shortage only partly remedied by importation of a few heavy howitzers from France. Realizing the danger, and anticipating the inauguration of an Austrian offensive, General Cadorna as commander in chief had in April inspected the Trentino army (First Army) and had replaced the inefficient General Brusati (who was later retired from the army in disgrace) by General Pecori-Giraldi, who had shown exceptional ability as a corps commander.

Against the ill-prepared Italian lines in the Trentino the Austrians had quietly concentrated 350,000 men. Forty 12-inch Skoda howitzers, three or four German 420-millimetre (17-inch) howitzers, and several 15-inch naval guns, with 700 heavy guns of smaller calibre, and 1600 lighter field pieces, were massed on a front of less than 30 miles, ready to overwhelm the Italians by sheer weight of metal. After a terrific bombardment (May 14th), the Austrian infantry rushed forward on May 15th all along the front from Rovereto to Borgo. Just south of Rovereto, after five infantry attacks in quick succession, the peak of Zugna Torto (5415 feet) was taken, May 18th. On the left wing, south of Borgo, the Austrians stormed Armentara Ridge, May 19th. The brunt of the attack was toward the centre, converging in the general direction of the Italian cities of Asiago and Arsiero. Heavily backed by long-range artillery fire, a strong Austrian column hammered its way through the Italian position in the Val Terragnolo, east of Rovereto, storming the peak of Monte Maggio (May 18th), Monte Toraro (May 19th), and Col Santo (May 19th), and crossing through Borcola Pass into the upper Posina Valley, which leads down to Arsiero. Abandoning most of their heavy guns, the Ital-

ians in this region retreated in such confusion that in several instances whole regiments lost their way and valuable strategic points were sacrificed without a struggle. Between May 20th and May 24th Count Cadorna (who had personally taken charge of the Trentino operations) attempted to reform his line well inside the Italian frontier, south of Posina, east of Asiario and the Val d'Astico, and east of the Val d'Assa. The Austrians, relentlessly pursuing, descended the Posina Valley to Arsiero (seven miles inside the Italian border). The Italian troops that should have occupied the commanding height of Pria Forà (two miles south of Arsiero) on the night of May 29th lost their way in the dark and fell back further south to the inferior height of Monte Ciove. From Pria Forà, at an elevation of 4959 feet, the victorious Austrians could look down upon Schio and Thiene, less than 10 miles to the southeast, where the foothills of the Venetian Alps give way to a gently sloping plain, nowhere more than 500 feet above sea-level. Only 20 miles from Arsiero lay the city of Vicenza; 20 miles further, Padua; and another 20 miles across the plain would bring the invader to Venice. Exultantly the Austrian order of the day, June 1st, announced that only one small mountain ridge (Ciove) remained to be crossed before the army of invasion could swoop down into the Venetian plain. Fully conscious of the peril, Count Cadorna 10 days previously had ordered the concentration of every available reserve at Vicenza. To the troops holding the line south of Arsiero he issued the memorable order, June 3rd, "Remember that here we defend the soil of our country and the honor of our army. These positions are to be defended to the death." And they were defended. On Monte Ciove, the key-position, one gallant Italian brigade held fast though 4000 of its original 6000 men were either killed or wounded. Meanwhile, another Austrian column striking southward from Borgo had crossed the Val Sugana, stormed Armentara Ridge, broken through the frontier on May 26th, reached Monte Mosciagh (five miles inside the frontier) on May 27th, and occupied the Italian city of Asiago (eight miles inside the frontier) on May 28th. While the centre and left wing of the Austrian army of invasion had thus far been brilliantly successful, the right wing, which should have advanced south from Rovereto in order to shield the centre from flank attack, had encountered desperate resistance at Coni Zugna and Buole Pass, May 24th–30th. According to Italian reports, 7000 Austrians fell in a single day's fighting at Buole Pass, May 30th. On Monte Pasubio, also, the Italians stood unflinchingly against odds of four to one and under a nerve-shattering bombardment. For three weeks the Austrian howitzers deluged Pasubio, Buole, and Zugna with high explosives; for three weeks dense masses of Austrian infantry were hurled against the Italian positions; still the Italian defense stood firm. Had it yielded, the Austrian right wing could have advanced down the valley of the Leogra toward Schio; Cadorna's lines south of the Val Posino (in which lies Arsiero) would have been outflanked; and the plain of Venetia would have lain open to the invader. Thanks, however, to the heroic stand at Pasubio, the Italian line south of Arsiero was saved. Nor could the Austrians break through on the opposite flank, south of

Asiago (Asiago is nine miles northeast of Arsiero). Directly south of Asiago, in the region of Monte Lemerle and Monte Magnaboschi, on the rim of the Sette Comuni plateau, the Austrians made their final effort on June 18th when they flung 20 battalions (20,000 men) against a 2-mile front, and failed. The Austrian offensive was definitely checked.

As the result of a month's exertions, the Austrians had inflicted very serious losses on the Italian army; they had captured a large number of big guns, which the Italians could ill spare; they had recovered 270 square miles of Austrian territory; they had conquered 230 square miles of Italian territory; and they had improved their strategic position. On the other hand, as the events of the summer were to show, the Austrians had failed to avert Cadorna's offensive, and they had so seriously weakened their Eastern front that Russia was able to invade Galicia and the Bukovina in June (see below, IV, 11). In this connection it may again be repeated that the valorous Italian defense of Pasubio, Ciove, and Sette Comuni might have gone for naught if Russia had delayed her counter-attack by even as little as a fortnight.

(10) *Verdun: Third Phase (May-June).*

To an observer unaware that the Allies were holding immense forces in reserve for a concerted summer offensive, the military situation in May and during the first few days in June must have appeared very unfavorable indeed for the Entente Powers. The Italians were reeling back from the Trentino in dismay at the power of the Austrian offensive; in Macedonia the Bulgars began to move southward against Sarrail and seized Fort Rupel; Russia seemed impotent after her futile March offensive; General Townshend had just surrendered at Kut-el-Amara (below, IV, 14) in April; the convention by which Rumania in April agreed to sell her surplus grain to Germany was interpreted by the *New York Times*' "Military Expert" as signifying "that in all probability Rumania will not enter the war at all and if she does it will not be for a long time hence." Meanwhile in France the Germans were still delivering furious attacks on the Verdun sector and—to any one ignorant of the fact that Joffre was deliberately refusing to throw his reserves into the battle before the hour for the great offensive struck—it appeared that after almost two years of the war, the Anglo-French armies in France were still too weak even to hold their own against the Germans, not to speak of expelling the invader.

During May the French troops on Le Mort Homme, west of the Meuse, were compelled to relinquish trench after trench before violent German assaults. An intense bombardment of Le Mort Homme and Hill 304 during the first week of May prepared the way for a vigorous infantry attack, May 7th-8th, by three fresh divisions. A still more determined attack was delivered on May 17th-18th. But this was as child's play compared with the assault which ensued two days later. On May 20th over 60 German batteries concentrated their fire upon Le Mort Homme; on the northeastern and northwestern slopes of the hill, the French first-line trenches were literally blasted out of existence; then the German infantry charged in

"big columns of 500 or 600 men, preceded by two waves of sharpshooters"; in some places seven and eight successive waves of infantry, 50 yards apart, braved the French machine-guns; and the French first-line position on the northern slopes of Le Mort Homme was won. While the battle raged on the slopes of the hill, the summit (295) was evacuated by the French and became "no man's land," swept by shells from both sides. The new French line on the sides of Le Mort Homme resembled a horseshoe, with the opening at the north, where the Germans had thrust their salient toward the summit by the attack of May 20th. A few days later, May 23rd-25th, the Germans attempted to cut in behind the Mort Homme position from the southeast by storming Cumières village and driving the French line back to the outskirts of Chattancourt. The French horseshoe around Le Mort Homme would thus be converted into an extremely perilous salient, three quarters encircled by the enemy. A French counter-attack on May 26th, however, regained at least part of the heap of ruins which had been the village of Cumières, and during the next few days a savage hand-to-hand combat was carried on among the heaps of debris and in the cellars of Cumières. Finally on May 29th the 60 German batteries of heavy artillery again poured a torrent of high-explosive shells, continuing 12 hours, on the whole French line west of the Meuse from Cumières to Avocourt, and a new infantry assault was launched, in which at least five fresh divisions participated. It was the climax of the campaign on the western bank of the Meuse. The French were expelled from Cumières; Caurettes Wood, southwest of Cumières, was stormed; and the summit of Le Mort Homme was gained; but the French still clung to the southern slopes of the hill.

The battle on the right bank of the Meuse was quite as violent. General Nivelle, who had succeeded Pétain at Verdun when the latter was promoted, early in May, to the command of the whole army-group on the Soissons-Verdun sector, had secretly brought up a number of big guns behind Vaux, in preparation for an ambitious counterstroke. The German airships, which served as the eyes of the German artillery, were shot down at the very outset. Two days' bombardment preceded the French attack. Then at 10 minutes before noon on May 22nd the gray figures of French infantrymen were seen creeping forward, in irregular groups, toward the German position at Fort de Douaumont. It took exactly 11 minutes for the 129th French regiment to cross three lines of ruined German trenches and to reach Fort de Douaumont. Having penetrated the fort, however, the French were unable to expel the Germans from the northern corner, and on the 24th, after withstanding fierce counter-attacks for two days, the French yielded the fort before the onslaught of two Bavarian divisions. It was now the turn of the Crown Prince to resume the offensive on the Heights of the Meuse. Douaumont, Fort de Douaumont, the village of Vaux, and part of La Caillette Wood, it will be remembered, had already been conquered by the Germans. Fort de Vaux was the next objective. Throughout the week of May 31st-June 6th the battle for Fort de Vaux raged with inconceivable fury. First the Germans attacked

from the northwest; then a Bavarian regiment circled round to the east and gained a footing in the village of Damloup, three quarters of a mile east of Fort de Vaux; on the night of June 2nd the Germans actually set foot in the outer ditch of the fort; a new surprise attack from the southeast failing, new assaults were directed from the opposite quarter; in the night of June 4th the Germans attempted to scorch the French garrison with jets of liquid flame; still the garrison held out until all communication with the outside world was cut off and the men were left with neither food, water, nor munitions. Only then did Fort de Vaux surrender, June 7th. In recognition of the garrison's heroism, Commandant Raynal was permitted by his captors to retain his sword. By the reduction of Forts de Douaumont and de Vaux the Crown Prince had opened a breach in the outer ring of Verdun's permanent fortifications,  $4\frac{1}{2}$  miles northeast of the city. The next obstacle would be Fort de Souville, or rather the hill (precisely the same altitude as Fort de Douaumont) upon which Fort de Souville was situated, not quite two miles southwest of Fort de Vaux and a little more than two miles directly south of Fort de Douaumont. Fort de Souville might be approached either from the north, by way of Thiaumont Farm, Thiaumont Redoubt, and Fleury village, or from the northeast, by way of Damloup Redoubt, and the woods of Le Chenois and La Laufée. The Germans during June tried both approaches. Thiaumont Redoubt and Fleury were gained on June 23rd-24th, but were subsequently recaptured by the French; similarly Damloup Redoubt was captured, recaptured, and captured again. Throughout July and August Fleury and the two redoubts repeatedly changed hands. The battle lost its intensity, however, early in July, when a new drive, comparable to the German drive at Verdun, was begun by the Anglo-French forces on the Somme. From February to July, the Germans had gained 130 square miles or more of battle-scarred French territory, with two demolished forts and two score desolate ruins of villages. As the price of this gain, probably as many as 500,000 and certainly no fewer than 250,000 German soldiers had laid down their lives, or fallen wounded on the field of battle, or been captured by the French. According to Anglo-French critics, the French loss at Verdun had been very much smaller; according to German critics France had suffered even more grievously than Germany; probably we shall not be far from the truth, however, in guessing that the French casualties were slightly inferior to the German. But Germany faced the discouraging fact that her tremendous sacrifices had failed of their chief purpose, while France rejoiced in the consciousness that the battle-cry of the soldiers at Verdun, "Passeront pas!" ("They shall not pass"), had been realized in truth. (See below, IV, 20.)

#### (11) *The Russian Drive (June 4th-August 15th)*

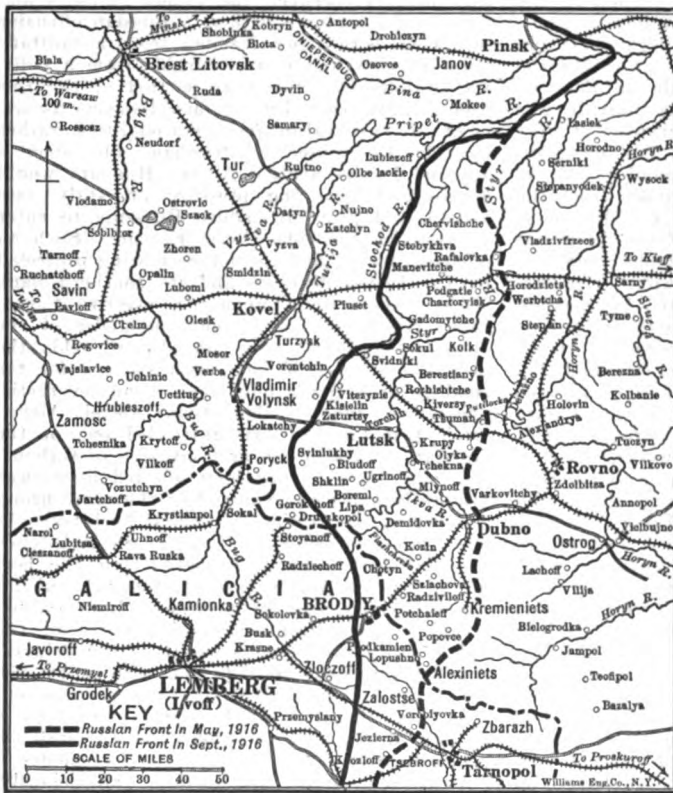
The first of the series of great offensives planned by the Allies for the summer of 1916 was the Russian drive, which began on June 4th and continued for about 10 weeks. The Russians elected to deliver their attack on the southern third of the front. In the central sector, which extended north from the Pripet

Marshes across the Lithuanian plain to the lake region northeast of Vilna, the opposing line was held too strongly by hardened German veterans for General Evert to attempt an offensive there with his raw Russian recruits—it must be remembered that during the great retreat of 1915 Russia had lost 1,500,000 of her best troops. Nor was an offensive feasible along the northern third of the long Russian front; even if General Kuropatkin, commander of the Russian armies of the north, had the courage and ability to try conclusions with the master-strategist of Germany, Field Marshal von Hindenburg, the network of lakes and rivers and the broad stream of the Dvina would impede a Russian drive just as effectively as they had blocked Field Marshal von Hindenburg's advance toward Riga and Dvinsk. On the southern sector, however, between the Pripet Marshes and the Russo-Rumanian border, a Russian offensive would be both more feasible from a military point of view and more desirable from a political standpoint, since that portion of the line was mainly manned by a miscellaneous assortment of Austro-Hungarian nationalities, rather than by the invincible Prussians, and since a successful drive against Austria-Hungary would certainly relieve the pressure on Italy (see above) and probably induce Rumania to enter the war on the side of the Entente. Such an offensive would find its northern wing protected by the Pripet Marshes and its southern flank could rest securely upon the massive Carpathian ridge. Moreover, the commander of the Russian southern sector was by all odds the best man who could have been selected for the conduct of a great offensive: Lean, energetic, aggressive, indefatigable, Gen. Alexei Alexeivitch Brusilov had brilliantly led one of the Russian armies in the first invasion of Galicia; in April, 1916, he had been selected to succeed Ivanov in supreme command of the army group comprising the armies of General Lechitsky (in the Dniester region), General Shcherbatchev (in Galicia), General Sakharov (on the border of Galicia and Volhynia), General Kaledin (in Volhynia), and later, General Lesh (transferred in June from the region north of the Pripet to the district just south of the Pripet). Against the scant 800,000 men with whom the Austrian Archduke Frederick was able to oppose him, Brusilov could muster more than a million, with another million of half-trained recruits to draw upon for later reinforcements.

Brusilov's drive began most auspiciously. Military critics were no less surprised than the Austro-Hungarian trenchmen were dismayed at the immense quantities of high explosive shells with which the Russian artillery accurately and thoroughly bombarded the Austrian defenses. Following the artillery preparation, Brusilov on June 4th launched simultaneous infantry attacks at innumerable points all along the 250-mile front from the Pripet to the Pruth, rudely interrupting the festivities with which at that very moment the Archduke Frederick's sixtieth birthday was being celebrated behind the Austrian lines. In Volhynia the initial attack opened a wide breach in the Hungarian lines west of Rovno, which, it will be recalled, is the eastern apex of the famous Volhynian triangle of fortresses. The two western corners of the triangle, Lutsk and Dubno, had fallen into Austrian hands in 1915, but the Russians

retained Rovno. Advancing westward from Rovno, the Russians had two vitally important railways to rely upon, the southern running in a southwesterly direction from Rovno across the marshy Ikva valley, through the oak forests of Dubno, crossing the Galician frontier near Brody, and leading straight to Lemberg, the heart of Galicia; the other railway from Rovno followed a northwesterly direction, crossing the Styr River just north of Lutsk, and leading to Kovel, a point of great strategic value, since it was situated at the junction of three great railways—the Kiev-Warsaw line, the Rovno-Kovel-Brest Litovsk line, and the newly completed Kovel-Vladimir Volynski-Lemberg line. Brusilov's plan was to strike first at Lutsk, by a march across the open country in

military stores, heavy guns, and thousands of wounded soldiers were abandoned at Lutsk. Four days later, Rozyshche and Dubno fell. Screened by the swift advance of Cossack cavalry, the Russian infantry rapidly spread out in a great fan-shaped or wedge-shaped salient west of the Volhynian fortresses. Northwest of Rovno, the town of Kolki, on the Styr, was captured. Along the Rovno-Kovel Railway, the Russians reached the Stokhod River at Svidniki (12 miles northwest of Rozyshche). Along the highway west of Lutsk, they covered about 25 miles in the week of June 17th-23rd, and reached Zaturtsy, more than half way from Lutsk to Vladimir Volynski. Just south of the Lutsk-Vladimir highway, they penetrated as far west as Lokatchy (only 15 miles from Vladimir), Sviniutchy, and Gorokhov. On the Rovno-Dubno-Lemberg Railway, the Russians took Kozin (18 miles southwest of Dubno) on June 13th; the Plashevka River was forded by Russian infantry, though the water was chin-deep and one company was entirely engulfed; and on June 16th the frontier station of Radzivilov (30 miles southwest of Dubno) was occupied. Southeast of Radzivilov, the line was pushed to Podzavez and Novo Alexiniets. Within the short space of 13 days, June 4th-16th, the Russian offensive in Volhynia had driven a wedge 50 miles deep (at its furthest point, due west of Lutsk) and 90 miles broad (at its base) into the Austrian lines west of Rovno, and the VIII Russian Army, under General Kaledin, which had borne the brunt of the battle, had captured over 70,000 Austrians, with 83 guns, 236 machine-guns, and endless quantities of munitions and other supplies.

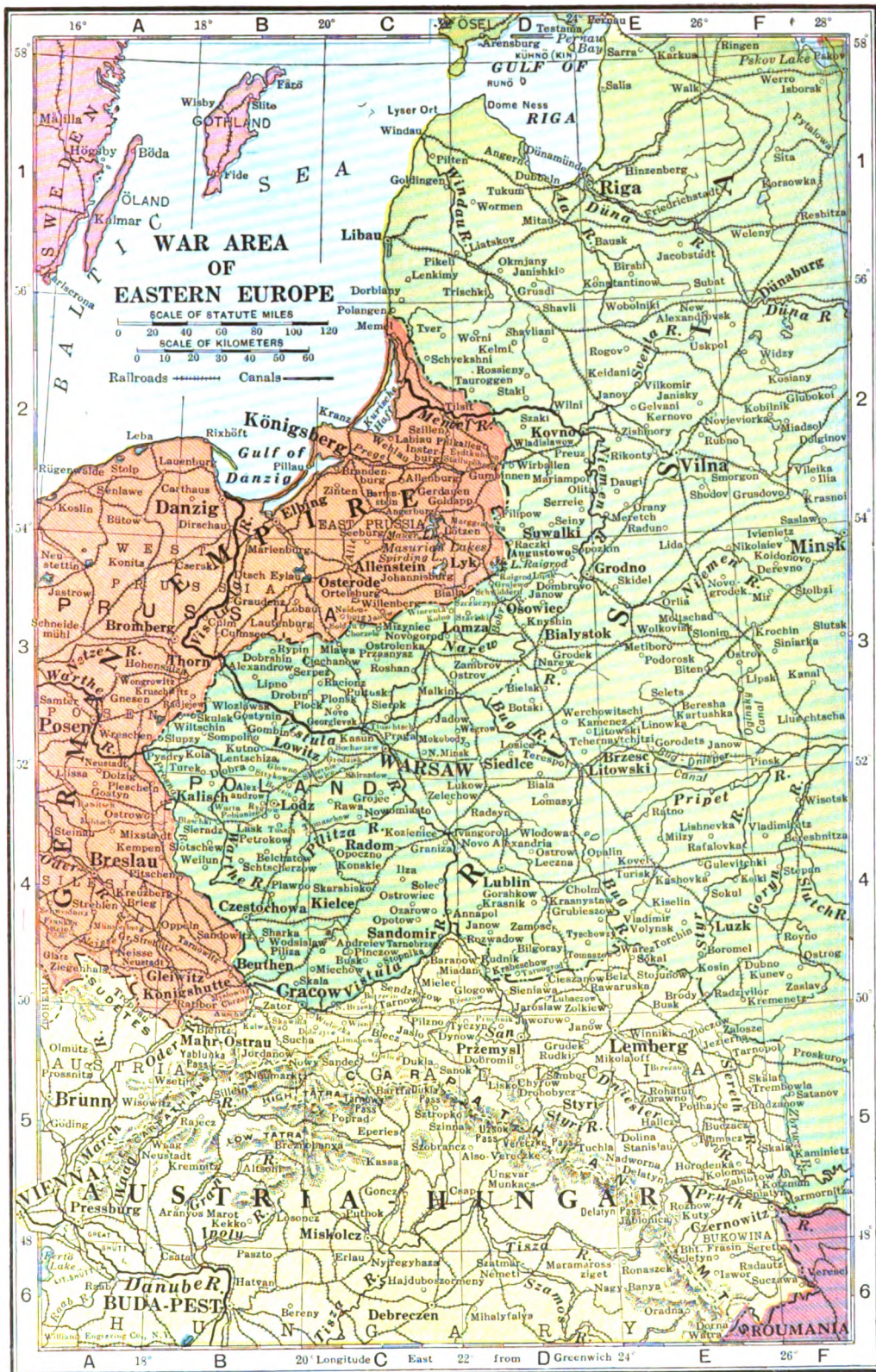


THE RUSSIAN DRIVE IN VOLHYNIA

the angle between the two Rovno railways, and then, having shattered the Austro-Hungarian lines, he could move north against Rozyshche, where the Rovno-Kovel railway crosses the Styr, and south against Dubno, where the Rovno-Lemberg line crosses the Ikva. The blow against Lutsk succeeded beyond hope. Through the gap caused by the collapse of two Hungarian divisions of Slavic composition, Brusilov's impetuous cavalry dashed on irresistibly; in the first two days the Russians advanced 20 miles across difficult terrain; and on the evening of June 6th they entered Lutsk, only a few hours after the city had been evacuated by the commander of the IV Austrian Army, Archduke Joseph Ferdinand. So precipitate had been the retreat of the Austrians that valuable

the great drive. Sakharov, on the border of Volhynia and Galicia, had assisted General Kaledin by capturing Radzivilov, on Kaledin's southern flank, but had been unable to break the strong line of the Bavarian General Count Bothmer, west of Tarnopol. Shcherbatchev had stormed the almost impregnable Austrian positions on the plateau of southeastern Galicia, where the deep river cañons, cut like trenches on the face of the tableland, offered wonderful advantages to the defense. Shcherbatchev's success was crowned by the capture of Buczacz, June 8th, on the Strypa River, commanding the angle of upland between the Strypa and the Dniester.

The left wing of Brusilov's army-group, the IX Army under General Lechitsky, had in the





meantime forced its way across the Dniester and into the Bukovina. Of the three bridges across the Dniester in this region, the one at Usciesko had been captured by the Russians in the spring; the one at Zaleshchyki was well defended by the Austrians; the easternmost bridge, at Utsie Biakupie, north of Okna, was selected by General Lechitsky because at that point the low southern bank of the Dniester could easily be dominated by Russian guns on the northern bank. On June 4th Lechitsky threw his infantry across the river at Utsie Biakupie and occupied Okna. Simultaneously another Russian column, from Bessarabia, took the Austrians by surprise at Dobronovtse, south of the Dniester and east of Okna, on the hilly peninsula between the Dniester and the Pruth rivers. By June 11th victory was assured at Dobronovtse, and more than 18,000 Magyar troops were captured. On the following day the bridgehead at Zaleshchyki, having been outflanked from the southeast, was evacuated by the Austrians; the town of Horodenka fell on June 12th, Sniatyn on June 13th. June 13th found Lechitsky at Sadagora on the northern bank of the Pruth River, opposite Czernowitz, the capital of the Bukovina.

Thus far he had captured 757 officers, 37,832 men, 49 guns, 120 machine-guns, and 21 trench mortars. On June 16th the crossing of the Pruth was forced, and on the following afternoon, June 17th, the Russians entered Czernowitz. The brilliant successes won by Brusilov in the first fortnight of his offensive were convincing proof of the recuperative power of Russia. Only eight months had been required to replace the armies which von Mackensen and von Hindenburg had shattered, and to train a new generation of petty officers and raw recruits; when it is considered that in order to provide munitions for a great drive, Russia's scanty domestic product had to be supplemented by huge imports from Japan, by way of the Siberian Railway, or from Great Britain and the United States, by way of the White Sea, the Russian achievement becomes all the more amazing. On the other hand, Brusilov's exploit was an amazing revelation of the hollow self-confidence of the Austrian military authorities. Apparently the Austrian general staff had taken it for granted that Russia was beaten, and that the advanced lines in Volhynia could be permanently fortified and thinly manned. In some sectors, the Austrians had constructed five successive lines of trenches—admirable trenches, 15 feet deep, and solidly protected with

timber and concrete work. Concrete-and-steel blockhouses, "neats" of machine-guns, and miles of intricate barbed-wire entanglements reinforced the line. Wherever possible, comfortable dugouts were prepared for the men. In the marsh region of northern Volhynia, elaborate parapets were constructed; log-roads were laid down, bridges built, and field railways extended to strategic points. Behind the lines, gardens and grain fields were cultivated by the soldiers; there were tennis courts and luxurious cottages for the officers; each army had its slaughter-house, its sausage-factory, and its bakery. Relying upon the strength of its carefully prepared entrenched lines, the Austro-Hungarian general staff had left less than 800,000 men to hold the Russian front, without reinforcements in reserve, while 350,000 men and a large number of Austria's heaviest guns were being used in the Trentino offensive (see above) against Italy. When the Russian attack came, the Austrians were taken at a tremendous disadvantage. Their artillery was too weak to reply effectively to the Russian "hurricane fire"; the Russian gunners were able to demolish the barbed-wire entanglements in front of the Aus-



THE RUSSIAN INVASION OF THE BUKOVINA AND GALICIA

trian trenches; and while the Russian infantry charged, the Russian artillery placed an impenetrable "curtain of fire" behind the Austrian first line, so that the Austrians were caught in their trenches like rats in a trap, and either surrendered or died by the bayonet.

Once the line had been broken, Brusilov's immense superiority in cavalry enabled him to harass the retreating Austrians, capture their guns, and make thousands of prisoners.

After the first fortnight, the Teutonic line in Volhynia began to stiffen, as German reinforcements arrived. At least four divisions were brought from France; others came from von Hindenburg's northern armies; the Austrians, also, with frantic haste, recalled division after division from Italy. Reinforced, the Austro-German armies west of Lutsk not only stood their ground, but regained a few miles by violent counter-attacks, between June 16th and July 4th.

Meanwhile, General Lechitaky, in the south, had been completing the conquest of the Bukowina. The towns of Storozynetz and Kutchurmare surrendered to him on June 18th; the following day he crossed the Sereth River (not to be confused with the other Sereth River, in Galicia), to the southward; Radautz, 30 miles south of Czernowitz, was occupied on June 21st, Gora Humora (20 miles further south), on June 22nd, and Kimpolung on June 23rd. By June 26th, according to a Russian *communiqué*, the greater part of the Bukowina was in Russian hands and Russian cavalry was "approaching the Transylvanian Passes."

From the Bukowina Lechitaky turned westward, into Galicia. About 60 miles west of Czernowitz is Jablonitsa Pass, through which a railway connects Maramoros Sziget and Korosmezo on the Hungarian slope of the Carpathians with Delatyn, Nadvorna, and Kolomea on the northern or Galician side. Toward this pass Lechitaky advanced up the Pruth valley. A strong Austrian army, which attempted to confront him at Kolomea, was thrown into confusion by a double flanking movement; on the south the Austrians were attacked by a Russian column which had advanced by way of the Kuty-Kossov-Pistyn-Jablanow road, while on the north there suddenly appeared a Cossack regiment which had swum the river in the rear of the Austrian position. In the battle before Kolomea, June 28th, the Austrians were completely routed and lost 10,500 in prisoners alone. On the following day Lechitaky entered Kolomea. A week later, a detachment of Lechitaky's cavalry, after a long and dangerous detour through the Carpathian foothills, by way of Berezow, cut the Delatyn-Korosmezo Railway 10 miles south of Delatyn. The fall of Delatyn ensued, on July 8th. Lechitaky was now master of the northern approach to Jablonitsa Pass. In the second phase of his campaign, thus happily consummated, he had captured no less than 31,500 men, 18 guns, and 100 machine-guns.

During July, interest shifted to Brusilov's northern armies, in Volhynia. On July 4th, General Leah, with an army borrowed from the sector north of the Pripet, attacked the Austro-German line on the plain skirting the southern fringe of the Pripet marshes, along the line of the Sary-Kovel railway. Starting at the Styra, north of Kolki, Leah, in three days, drove forward to the Stokhod, 30 miles further west, the last strong defensive line before Kovel, 20 miles beyond. A narrow, shallow river, the Stokhod, was nevertheless a serious obstacle, since its course was bordered by marshy flats, and German guns planted on the somewhat firmer western bank would play havoc with Rus-

sian artillery or infantry floundering among the reeds and water lilies on the eastern side. Nevertheless, the Russian generals Leah and Kaledin boldly attacked the Stokhod line July 28th-August 3rd and actually effected a crossing at Gulevitche, at Janovka, and at several other places, but for some reason they failed to advance further, although the important railway centre of Kovel now lay almost within gunshot.

While Leah and Kaledin were fighting on the Stokhod, General Sakharov dealt the Austrians a new blow southwest and south of Lutsk. At three in the morning of July 16th, Sakharov's troops stormed the Austrian trenches near Shklin (about 18 miles southwest of Lutsk), captured 13,000 men, and threw the Austrians back on the line of the Lipa River (a tributary flowing into the Styra from the west, at a point 25 miles south of Lutsk and 7 miles north of Berestechko) in a disorderly rout. A battle in the angle of the Lipa and Styra rivers, July 20th-22nd, gave Sakharov the town of Berestechko with 12,000 more prisoners. A third battle, July 25th-28th, in which 14,000 Austrians were captured, delivered Brody into Sakharov's hand. From Brody the victorious Russian general struck south down the valley of the upper Sereth, toward Zalostae, against the northern flank of General von Bothmer's Austro-German army, and forced the latter to fall back, about the middle of August, from the line of the upper Sereth and Styra rivers to the line of the Zlota Lipa River.

Just as Sakharov was outflanking Bothmer from the north, Lechitaky and Shcherbatchev turned the Bavarian general's right or southern flank. Lechitaky, after a month's inactivity, moved forward on August 7th, defeated his antagonist at Tlumatch, August 7th, and approached Stanislaw, in conjunction with Shcherbatchev, who had overcome stubborn resistance on the River Koropiets and was advancing along the northern bank of the Dniester. The Austrians made no attempt to defend Stanislaw, and Lechitaky occupied the city on August 10th. In the next few days Lechitaky swept the whole region between Stanislaw and the Carpathians, and occupied Solotvina, Nadvorna, and other towns. North of the Dniester, Shcherbatchev simultaneously captured Monasterzyaka, August 10th, crossed the Zlota Lipa near its confluence with the Dniester, and drove forward to Mariampol, August 13th. Up to August 13th, Shcherbatchev had captured 1263 officers and 55,158 men. With Shcherbatchev at Mariampol and Sakharov south of Brody, the German Count Bothmer, who had been tenaciously defending the Upper Sereth and the Middle Styra, found his flanks so seriously threatened that he hastily evacuated Podgaicy and Zborov August 13th, and fell back to the Zlota Lipa, which parallels the Styra at a distance of about 15 miles to the west. Bothmer's retreat was generally regarded as marking the last phase of the Russian drive, although Shcherbatchev made a further advance the first week in September, when he broke through the Zlota Lipa line at Brzezany, forced Bothmer back to the Narayuvka (a tributary of the Gnila Lipa, which flows into the Dniester about 15 miles west of the Zlota Lipa), and bombarded Halicz. Turkish reinforcements enabled the Austro-German army in this sector to deliver persistent



counter-attacks in September and October.

The result of the Russian drive was summarized by the Russian war office in the middle of August. The supposedly impregnable Austro-German lines in Volhynia and Galicia had been carried on the whole front of 250 miles to a depth varying from 20 to 50 miles, north of the Dniester, and over 60 miles south of the Dniester. The entire Province of the Bukowina had been conquered. Altogether, between June 4th and August 12th, some 358,000 men, 406 guns, 1326 machine-guns, and 338 mine- and bomb-throwers had been captured. If these official figures may be credited, the Central Powers lost more heavily in men and in *matériel* by the Russian drive than by the costly failure at Verdun. Indirectly, the Russian drive saved Italy, drew German troops from Verdun, and helped induce Rumania to enter the war. It was a far smaller victory than that won the previous summer by von Hindenburg, but it was still a very substantial success. To detract from the Russian victory, Austrian statements were issued pretending that the Russian losses in the summer of 1916 were much larger than the Austro-German casualties, and that therefore Russia was really the chief loser by her offensive. German military critics claimed that Russia's apparent inability to press her advantage further, or even to hold all her gains, after August 15th, proved her exhaustion. The French journal *Le Temps*, however, quoted General Kuropatkin to the effect that the Russian drive expired simply because the Russians had exhausted their supply of shells and worn out their howitzers and field guns.

(12) *The Anglo-French Offensive on the Somme (July 1st—).*

"The plan elaborated by the councils of the coalition (Entente) is now in full course of execution." Such was the order of the day addressed to the soldiers of France by their commander in chief, on the eve of the great Anglo-French offensive on the Somme. Counting on the invincible tenacity of the French army of Verdun, which had doggedly resisted the Crown Prince's terrific attacks throughout four terrible months, Joffre quietly pushed forward his preparations. Even while it seemed as if the strain on the men at Le Mort Homme and around Fort de Vaux must soon pass the limit of human endurance, Joffre was holding in reserve a powerful army of half a million sturdy young recruits, and was laying up huge stores of high explosive shells for the forthcoming attack on the Somme. Great Britain, too, was making ready for the impending battle. The British Parliament had adopted conscription for single men in January; for married men, in May; and the new recruits were being drilled with feverish haste, to make up for lost time. In May, the British army in France was about 1,500,000 strong and there were at least a million men—some estimates placed the number as high as three millions—in training or in reserve; how many of these reserves were rushed to the trenches before July cannot be stated with certainty, but before the commencement of the offensive, British troops were manning 25 miles of the front in Belgium and 65 miles in France (from the Franco-Belgian border to a point south of the Somme River—just before

the drive the British were replaced by French soldiers south of the Somme and for one mile north of the Somme), and in the initial phase of the Somme drive at least five British army corps (the VIII, X, III, XV, and XIII) participated, coöperating with a French force which must have been of approximately the same strength. As the battle developed, it may be remarked, all estimates of the forces engaged became illusory, since neither side found it possible to maintain the same troops continuously in the battle-line; the strain of the fighting was so intense that troops were quickly exhausted and had to be transferred to the reserve or to some quieter portion of the front, for a period of rest, while their places were taken by fresh troops or divisions borrowed from another sector.

In the technique of attack the Allies had many surprises in store for the Germans. Hundreds of airmen in "battle-planes" of an improved type, darting back and forth across the German lines, just before the attack, drove the German air-scouts to cover, dropped "fire balls" on the German observation-balloons ("sausages"), thus blinding the German artillery, and carried back wonderfully clear photographs of the German trenches, so that the Anglo-French artillery could accurately place its high-explosive shells precisely where they would do the most damage. The British, on Sir Douglas Haig's own admission, had "developed and perfected" the art of attacking the enemy with poisonous gas and liquid fire. An original British contribution to the art of trench-warfare was the "tank" (introduced in the second phase of the Somme drive, in September), a heavy motor-truck, encased in invulnerable steel armor-plate, and cumbrously moving on caterpillar treads. With machine-guns spitting murderously from apertures on either side, a "tank" could lumber across "no man's land" to the enemy's trenches, unscathed by ordinary rifle or machine-gun bullets; it could brush aside barbed-wire entanglements as though they were cobwebs; it could even crawl across trenches and shell-craters and spread confusion and panic behind the enemy's lines. Most impressive of all was the improvement of the British and French artillery. France now had a very large number of heavy guns, including some 16-inch mortars, and many military critics regarded the French howitzers, as well as the 3-inch field gun (the famous "*soixante-quinze*"), as distinctly superior to their German counter-parts. British arsenals, likewise, were now turning out howitzers of the largest calibre; the monthly output of heavy guns in Great Britain increased 600 per cent in the year from June, 1915, to June, 1916; the weekly consumption of high explosive was 11,000 times as great as the total output in the whole month of September, 1914; as many heavy shells could now be manufactured in four days as in the whole first year of the war. It was upon their tremendously powerful artillery that the Allies chiefly relied to blast a way through the wire entanglements, to plow up the intricate German entrenchments, to silence the German machine-guns before the infantry charge, and to cut off German counter-attacks by a "curtain of fire" or "*tir de barrage*." When on the night of June 30th—July 1st, the artillery "preparation" of the Somme drive reached its climax, "parapets crumbled beneath the impact of the

shells, cover hitherto thought bomb-proof was crushed and destroyed, and the garrisons of the enemy's works, sorely shattered in *morale*, were driven down into the deepest dugouts to seek shelter from the pitiless hail of projectiles."

Early in the morning of July 1st there came a lull in the thunder of the howitzers, as the gunners lengthened the range, and the infantry leaped forward from the trenches, with cheers, to charge the German lines. The attack was delivered on a front of full 30 miles, from Gommécourt to Estrées, on both flanks of the Somme River. The Somme, as a glance at the map will show, cuts the Western front at a point about 80 miles north of Paris and the same distance south of the Belgian coast. It is significant that the theatre selected for the 1916

tant town of Combles, three miles from the front, might constitute a preliminary objective. More important, however, than either Bapaume or Péronne, was the ridge or range of low hills (averaging about 500 feet above sea level), just behind the German lines north of the Somme; a line drawn west-and-east through Thiepval, Pozières, Bazentin-le-Petit, Longueval, Guillemont, Ginchy, Morval (Combles lay in a hollow, toward the eastern end of the ridge), and Saillisel will serve to indicate the line of the ridge, the chief immediate objective of the Allies' drive. Once firmly established on the Thiepval-Saillisel watershed, the Allies' guns could command the lower hillocks to the northward, the advance to Bapaume would be comparatively easy—as far as natural obstacles were concerned—and the German salient lying across the important Albert-Arras railway would be menaced, perhaps withdrawn. Some too sanguine "military experts" in the daily press looked for a speedy advance down the slopes northeast of Thiepval-Saillisel to Cambrai and Douai, two of the most important strategic centres behind the German lines; other critics predicted that the French would press on beyond Péronne to St. Quentin, thus making the German position at Noyon a dangerous salient; either of these operations, however, would have involved a more sweeping victory than the Allies had reason to expect.

In the first day of the great offensive, the British troops carried the villages of Montauban and Mametz, and broke through the "first line" (consisting of three or four parallel trenches, with a network of communicating trenches, altogether constituting the first of three or four entrenched "lines," a few miles apart) on a front of about seven miles, southeast of Fricourt, and along a four-mile front north of Thiepval, the attack was an utter failure. Moreover, on the front between Thiepval and the Somme, four strongly fortified villages—Thiepval, Ovillers, La Boisselle, and Fricourt—in which every ruined cottage and cellar was a nest of German machine-guns, still had to be reduced before the German first line could be completely carried. Fricourt was won on July 2nd, only after savage hand-to-hand fighting among the ruins; La Boisselle held out till July 3rd; Ovillers, till July 17th; Thiepval, till September 26th, although "Leipzig Redoubt," south of the village, was brilliantly stormed on July 7th. Greater success attended the French in the first week of the battle. On the northern bank of the Somme, where the French line joined the British, the French stormed the villages of Curlu (July 2nd) and Hem (July 5th). South of the river they fought their way more than three miles behind the German first line and entered the villages of Dompierre, Becquincourt, and Fay (July 1st), Frise (July 2nd), Herbécourt, Assevillers, Feuillères, Flaucourt, and Buscourt (July 3rd), Belloy-en-Santerre (July 4th), and Estrées (July 5th).

In the second week the French made slower progress. North of the river they advanced to Hardecourt-aux-Bois; south of the river, by a very vigorous attack on July 9th-10th, the French carried Biaches and La Maisonette Farm on the nearby hill. Péronne lay at their feet, only a mile distant, across the marsh-bordered Somme. In the fortnight's fighting, July 1st-



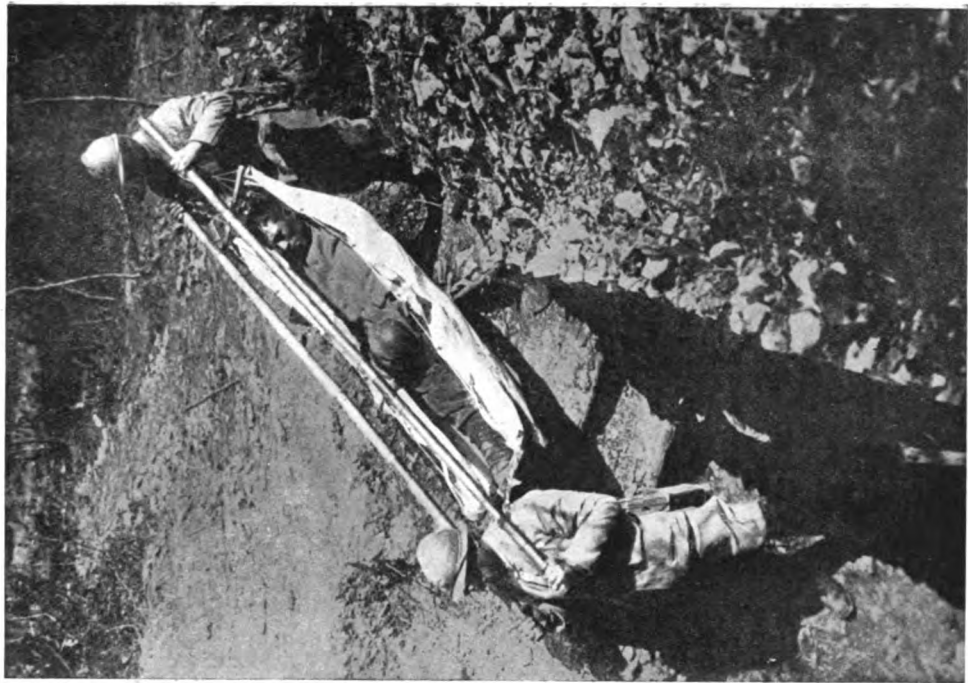
BATTLE OF THE SOMME SHOWING ANGLO-FRENCH OFFENSIVE IN 1916

offensive was 35 miles south of the Loos-Vimy sector, which had been attacked in September, 1915, and 45 miles south of Neuve Chapelle, the scene of the first British "drive" of March, 1915. The southward gravitation of successive Allied offensives proved that the Allies, temporarily at least, had abandoned hope of reconquering the rich coal and iron fields of Flanders and Artois; the new drive was launched not among mines and slag-heaps, but among the smiling agricultural villages of Picardy. The obvious objective for the British, who fought on the front north of the Somme, was the town of Bapaume, nine miles northeast of the front; for the French, who held a mile of the front on the northern bank and 4 miles (later extended to 10) south of the river, Péronne was the natural goal, 5¼ miles east of the French front and 12 miles southeast of Bapaume. Midway between Péronne and Bapaume, the less impor-



**MATHIOT MORTAR WITH PROJECTING BOMB READY FOR FIRING**

*French Official Photographs from Jacques Boyer, Paris*



**TRANSPORTING THE WOUNDED BY LITTER IN THE TRENCHES**

**TRENCH SCENES ALONG THE FRENCH LINES**



14th, the French had taken 12,235 prisoners, advanced their line on a front of 10½ miles to a maximum depth of 6 miles, and conquered 30 square miles of territory—a considerably smaller area than the Germans had gained at Verdun in the first week. On the British front, the second week witnessed a series of violent conflicts in Contalmaison, Trônes Wood, Bazentin-le-Petit, Bazentin-le-Grand, and Longueval; the Germans were fighting desperately for their second line, on the crest of the Thiepval-Sailliel ridge. In the first fortnight the British had advanced on a 10-mile front to a maximum depth of 3 miles, and had made 10,000 prisoners.

Badly battered, but not broken, the German line stiffened after the first fortnight. Furious German counter-attacks won back Biaches and La Maisonette Hill, opposite Péronne, on July 15th, for a few hours; again on July 17th, after six successive assaults in the midst of a driving rainstorm, the Germans recaptured La Maisonette Hill and Biaches, only to be again expelled. During the remainder of July and all of August, the French made very small gains, the principal achievements being the extension of the battle line as far south as Vermandovillers (July 20th), and the capture of Maurepas (August 11th-24th). The French drive had been brought to an abrupt halt. On the British front, likewise, the Germans made violent efforts to check the offensive. At points where the second line position had been pierced on July 14th-15th, namely, at Bazentin-le-Petit, Longueval, and Delville Wood, the German artillery hurled tons of asphyxiating and tear-producing shells; then the German infantry charged; at Longueval 13,000 men were flung against a narrow front of 2000 yards; at Delville Wood two German regiments were almost wiped out of existence July 29th. But at the end of July the British rested victorious in Longueval and Delville Wood; in addition, they had penetrated High Wood, in the centre, annihilated a battalion of the Prussian Guard at Ovillers (July 17th), and captured the village of Pozières, July 24th-26th, by a dogged fight from house to house. After a month of the great drive, the British found themselves in possession of 24 square miles of conquered territory.

During the long pause, lasting through the entire month of August, in which the Anglo-French drive came practically to a standstill, gaining at the most a few hundred yards here and there, the French and British heavy guns were being moved forward to new positions, to blast open the path for a new advance. A terrific bombardment on the night of September 2nd gave notice that the second phase of the battle had begun. At noon on September 3rd the infantry charged, with renewed confidence and dash. The British carried the village of Guillemont and part of Ginchy, east of Longueval, high up on the Thiepval-Sailliel ridge behind the German second position. The French simultaneously stormed the whole line from Le Forest (one mile south of Combles) to Cléry, on the north bank of the Somme. The decisive battle for the ridge, between Thiepval and Combles, now ensued. Gallant Irish troops, bearing the brunt of the battle on the heights northwest of Combles, expelled the Germans from Ginchy at the point of the bayonet and

repelled ferocious counter-attacks, September 6th-9th. British "tanks" (see above) appearing for the first time, smashed their way clean through the German trenches and were followed by infantry with hand-grenades. The artillery thundered with "unheard of violence." The whole German line between Thiepval and Combles was pushed over the ridge, and fell back from Martinpuich (September 15th), Courcellette (September 15th), Leshœufs (September 25th), and Morval (September 25th). Only Thiepval, at the northwestern end, and Combles, on the southeast, held out. But Combles was already enveloped from the south and east by the army of the French General Fayolle, whose troops had pushed out southeast of Combles to Bouchavesnes (September 12th), Le Priez Farm (September 14th), Rancourt (September 25th), and Frégicourt (night of September 25th). At the very last moment, on September 26th, the German garrison evacuated Combles, fighting as it went, and retired through the ravine to the northeast—the only avenue of escape still remaining open—under cross-fire from both sides. On the same day, at the opposite end of the ridge, Thiepval was stormed, and in the centre the British line was pushed to Gueudecourt, more than a mile north of the crest. The prisoners taken at Combles and Thiepval swelled the total, for the French, to 35,000; for the British, to 26,000. The French Generals Fayolle and Micheler, and the British Generals Gough (who took Thiepval) and Buttler were decorated by the President of the republic, in recognition of their exploit.

Torrential rains and weeks of cloudy weather hindered the further progress of the Anglo-French drive, by making it almost impossible to move the heavy guns forward, over muddy roads, or to direct artillery fire by aeroplane observations. The French infantry, to be sure, in October fought its way into Saily and Sailliel, but was repeatedly thrown back and did not completely occupy Sailliel until November 12th. The fall of Sailliel marked the completion of the conquest of the Thiepval-Sailliel ridge; at Saily, Sailliel, Leshœufs, and Gueudecourt the Allies were beyond the third (and last) line of trenches prepared by the Germans before the drive. On their right wing, the French had begun a movement against Chaules in September by capturing Chilly (September 4th), Soyécourt (September 4th), Berny-en-Santerre (September 4th-17th), and Vermandovillers (September 17th); in October they advanced through Bovent (October 10th) to the outskirts of Ablaincourt; in November Ablaincourt and Pressoire (November 7th) were taken; but Chaules still defied all assaults, though the French had been on its outskirts for four months. During the same period, the British extended their successes north of the Somme by storming "Stuff Redoubt" (September 27th) and part of "Schwaben Redoubt" (September 28th), on the crest of the ridge north of Thiepval. On the northeastern slope of the Thiepval-Sailliel ridge the British stormed Eaucourt l'Abbaye (October 1st-4th) and Le Sars (October 7th), the latter place being only four miles southwest of Bapaume, on the splendid Albert-Bapaume highway.

To the northwest of Le Sars lies the little ravine of the Ancre brook. In this ravine the German positions at St. Pierre Divion, Beau-

court-sur-Ancre, Beaumont-Hamel, and Grandcourt had become a dangerously slender salient, at the mercy of the British guns which had been posted on the heights of the Thiepval ridge. It was, therefore, no surprise when the British war office announced the capture of St. Pierre Divion (November 13th), Beaumont (November 13th), Beaucourt (November 14th), and part of Grandcourt (November 18th).

Measured in terms of territory, the results of the Anglo-French drive were small. Nowhere had the advance been more than seven miles. The total area conquered was approximately 120 square miles (erroneous newspaper estimates, confusing square miles with square kilometers, placed the figure higher), about equal to the area won by the Germans at Verdun, perhaps slightly greater. Neither Bapaume nor Péronne had been attained. Nevertheless, in his official report, Gen. Sir Douglas Haig, the British commander in chief, maintained that the drive had been a very great success, since it had achieved its three principal purposes: (1) it had relieved Verdun (see below, IV, 20); (2) by holding more than half of the German army on the western front it had enabled Russia to win a sweeping victory on the Eastern front; (3) it had worn down the German forces. By way of comment on the third point it may be noted that the German casualty list as added up by the British war office showed a grand total of 3,920,000 (since the beginning of the war) on December 1st, as compared with about 3,130,000 on July 1st; the difference, 790,000, represents the total German losses in killed, disabled, captured, and slightly wounded (the slightly wounded usually amount to 40 per cent or 50 per cent of the total) on all fronts, during the five months, July 1st to December 1st. In the battle of the Somme, therefore, the German loss could not have exceeded 700,000, allowing only 90,000 for losses on the Russian and Rumanian fronts. The British loss was announced as approximately 450,000 (deducting 37,000 for losses on other fronts from the grand total of 487,000 on all fronts) in the same five months (July to November, inclusive). The French published no official figures, but if the French lost even half as heavily as the British, the Somme drive must have cost the Allies in the first five months about 675,000 men, as compared with 700,000 for the Germans. It will easily be seen that the losses of the Allies on the Somme could not have been greatly inferior to those of the Germans. Anglo-French military critics and public men, however, were confident that even at such a rate, the Allies were indubitably winning the war by exhausting Germany.

(13) *The Italian Recovery (June-August).*

Two weeks after the beginning of the Russian offensive, Cadorna checked the Austrian invasion of Italy (see above) and inaugurated a vindictive counter-offensive. A new army of 500,000 men, with vast quantities of ammunition and heavy guns to replace those lost in the panicky retreat of a month before, were now at his disposition. In the face of Cadorna's assaults, the Austrians about June 25th began a retreat on the Trentino front and evacuated part, but by no means all, of the Italian territory conquered by their recent drive. On June 26th

the Italian war office joyfully announced the recovery of Asiago, Ceauna, and Monte Cengio; the following day, Arsiero and Posina. Arsiero had been "destroyed by fire" and Asiago lay in "smoldering ruins." The Austrian retirement was planned and executed with such skill that very few prisoners and almost no guns were lost. The new Austrian line ran from Rovereto southeast by way of Col Santo (6342 feet in elevation) and Borcola Pass to Monte Cimone (3690) on the edge of the Tonezza plateau north of Arsiero, and thence across the Astico and north of the Assa valley, turning northward near Asiago and running through Monte Meatta and Portule, to the frontier. Against so strong a front, the Italians made but little headway, although severe fighting continued throughout July. One of their chief successes was the capture of Monte Cimone, July 23rd, by Italian Alpini, who scaled the rocky face of the mountain with the aid of ropes and drove off the Austrians by means of bombs which were passed up from the valley below by a chain of men roped to the cliff.

Throughout July, Cadorna continued his energetic pressure against the Trentino front, but his principal blow was reserved for the Isonzo. Heavy mortars and howitzers, transferred from the Trentino, opened fire along the Isonzo front on August 4th, just five weeks after the beginning of the Anglo-French offensive on the Somme (below). The first day's attack, directed against Hills 121 and 85, just east of Monfalcone, was really a feint to draw the Austrian reserves toward the southern wing. The frontal attack delivered two days later along an eight-mile front opposite Gorizia was in deadly earnest. The Austrian trenches were pulverized by nine hours' continuous bombardment. The Italian infantry, believing that the hour of victory had at last arrived, charged with unexampled impetuosity. The heights of Monte Podgora and Monte Calvario on the western bank of the Isonzo, overlooking Gorizia across the stream, were carried the first day, as were also the heights of Oslavia and Monte Sabotino, further north. South of Gorizia, on the left bank of the Isonzo, the Italians stormed the summit of Monte San Michele, the key of the Gorizia position, for which they had striven in vain for 14 months. The Austrians resisted with stubborn courage. Isolated groups held out to the bitter end, in grottoes, in dugouts, or on inaccessible hilltops. General Boroevic, the Croatian general commanding the Austrian army of the Isonzo, urged his troops to "repulse the attack in such a way that none of the enemy shall escape." Nevertheless, after two days' battle, all the heights west of the Isonzo had been conquered, and Bersaglieri cyclists sent across the river into Gorizia. On August 9th the Italian infantry escorted King Victor Emmanuel and the Duke of Aosta (Italian commander on the Isonzo) in their triumphal entry into Gorizia.

After the conquest of Gorizia, there remained formidable obstacles to be surmounted before the Italians could hope to "emancipate" Trieste. East of Gorizia were frowning hills, bristling with Austrian guns. South of Gorizia, between the Wippach (Vipacco) Valley and the sea, lay the Carso plateau, barring the way to Trieste. The surface of this barren limestone mound or ridge, naturally scarred by in-



A TELEPHONE STATION IN THE FIRST LINE FRENCH TRENCHES  
DISTRIBUTING MAIL TO FRENCH SOLDIERS IN A TRENCH OF A DEFENSIBLE CANTONMENT  
A FRENCH ARMORED TRAIN

French Official Photographs from Jacques Boyer, Paris

THE WAR IN EUROPE







numerable caverns and crater-like depressions, had been covered by the Austrians with a veritable labyrinth of entrenchments, blasted in the solid rock, with subterranean communicating tunnels. Under these circumstances, the progress made by Italy's August offensive on the western rim of the Carso represented a very considerable effort. Hill 121, Monte Debeli, Oppacchiasella, Monte Pecinka, and Nad Logem were won only by dint of the hardest kind of fighting. The loss inflicted on the Austrians by the whole Italian offensive on August 4th-15th was estimated by the Italians at 65,000; the Italians announced that 18,758 prisoners, 30 guns, 63 trench mortars, 92 machine-guns, 60,000 grenades, and other booty had fallen into their hands.

Again and again Cadorna renewed his attack on the Carso. A four-day offensive in September, carried out by 150,000 men, advanced the Italian lines but little; in October, Hill 208 and the village of Novavas were stormed; in November eight divisions of Italian infantry assailed the Austrian lines on the Carso and on the heights east of Gorizia and captured 9000 Austrian soldiers. The total number of prisoners claimed by Italy on the Isonzo front between August 6th and November 4th was 40,365. When these figures are compared with the losses inflicted on the Central Powers by the Anglo-French offensive on the Somme (see above), it will be seen that Italy's share in the summer's fighting was not disproportionately small, although it may still be questioned whether Italy's exertions would not have been more effective if applied in some other theatre of the war, rather than on the Carso, where the nature of the terrain enabled the Austrians to oppose the Italian army with numerically inferior forces.

*(14) Russian Victories in Asia Minor (February-July).*

The same month—July—that witnessed the beginning of the Anglo-French drive on the Somme, the Italian reconquest of Monte Cimone, and the Russian victory at Brody was signalized also by a notable Russian triumph in Asia Minor, viz. the capture of Erzingan. The Grand Duke Nicholas, it will be recalled (see above, section 4), had advanced from Russian Transcaucasia into Turkish Armenia in January, inflicted a crushing defeat upon the Turks, and occupied the fortified city of Erzerum in February. During the spring the Russians had steadily advanced. The Grand Duke's northern wing swept the Black Sea coast from Batum to Trebizond, captured Trebizond (April 18th), and pushed on to the westward, taking Platana on May 11th; his centre had advanced against fierce resistance in the region just west of Erzerum; and his right had reached Mush (February 18th) and Bitlis (March 2nd), south of Erzerum and west of Lake Van. In July the Russian armies west of Erzerum drove forward with new vigor. Bulletins of victory followed one another in rapid succession, the capture of Mamakhatum being announced on July 12th, Baiburt, July 16th, and Gumushkaneh and Ardasar, July 22nd. Finally on July 25th the Russians took the city of Erzingan (110 miles west of Erzerum). Erzingan was an important strategic centre, where the barracks and arsenal

of the Tenth Turkish Army Corps were located.

*(15) British and Russian Reverses in Mesopotamia, Persia, and Kurdistan.*

In other operations against the Turks, however, the Allies were less successful. The ill-advised British expedition led by General Townshend (see 1915 YEAR BOOK, p. 720) against Bagdad, having rashly ventured more than 300 miles up the Tigris Valley, to within 18 miles of Bagdad, had been overwhelmed by superior Turkish forces, thrown back to Kut-el-Amara, 100 miles southeast of Bagdad, and there besieged, early in December, 1915, by Nured-Din Pasha. The detachment sent to relieve Townshend reached Umm-el-Henneh and Felahie but essayed in vain to cut its way through the Turkish line at Sanna-i-yat, 16 miles east of Kut-el-Amara. So completely was Kut-el-Amara invested, that no provisions could be sent to the starving garrison except by aeroplane. Nine tons of supplies were sent to Townshend in April by this means, but they were insufficient. At last the pressure of hunger constrained Townshend to surrender, on April 28th, after a siege of 143 days. Depleted by fighting and famine, Townshend's force at the time of surrender numbered only 8970 men, according to British reports, or at most 13,300, according to the Turkish announcement. Responsibility for the disastrous Bagdad expedition was attributed to Gen. Sir John Nixon, former commander of the British forces in Mesopotamia. Public opinion concurred in the verdict of a leading British historian of the war, that "on every ground of strategy and common sense," Townshend's expedition "was unjustifiable."

Misfortune also befell the Russian expeditions against Bagdad and the Bagdad Railway. During the winter of 1915-16 one Russian column had marched through Western Persia along the caravan route through Hamadan (Dec. 20, 1915), Kermanshah (Feb. 26, 1916), and Kerind (March 12th) to the Turco-Persian frontier, about 150 miles northeast of Bagdad. But in the summer, after the fall of Kut-el-Amara, this Russian column was routed by the Turks and pursued back into Persia, past Kerind, Kermanshah, and Hamadan. Another Russian army, about 200 miles further north, had crossed from Northwestern Persia into Asiatic Turkey near Rewanduz with the aim of cutting the Bagdad-Constantinople route at Mosul, 250 miles northwest of Bagdad and less than 100 miles west of Rewanduz; but this column, too, met defeat in July. Still further north, in the region west of Lake Van, the Russian army, which had taken Mush and Bitlis in the spring (see above, section 5) and advanced toward Diarbekr (on the Bagdad-Constantinople route, 200 miles northwest of Mosul), was so seriously defeated that it evacuated Bitlis and Mush August 7th-8th; Mush, however, the Russians were able to regain a fortnight later. The result of the year's fighting in Armenia, Kurdistan, Mesopotamia, and Persia may be summarized in the statement that, while the Russians had conquered "old Armenia," the Turks had not only repulsed three Russian and one British expedition against the Bagdad route, but had even undertaken an extensive aggressive campaign in Northwestern Persia.

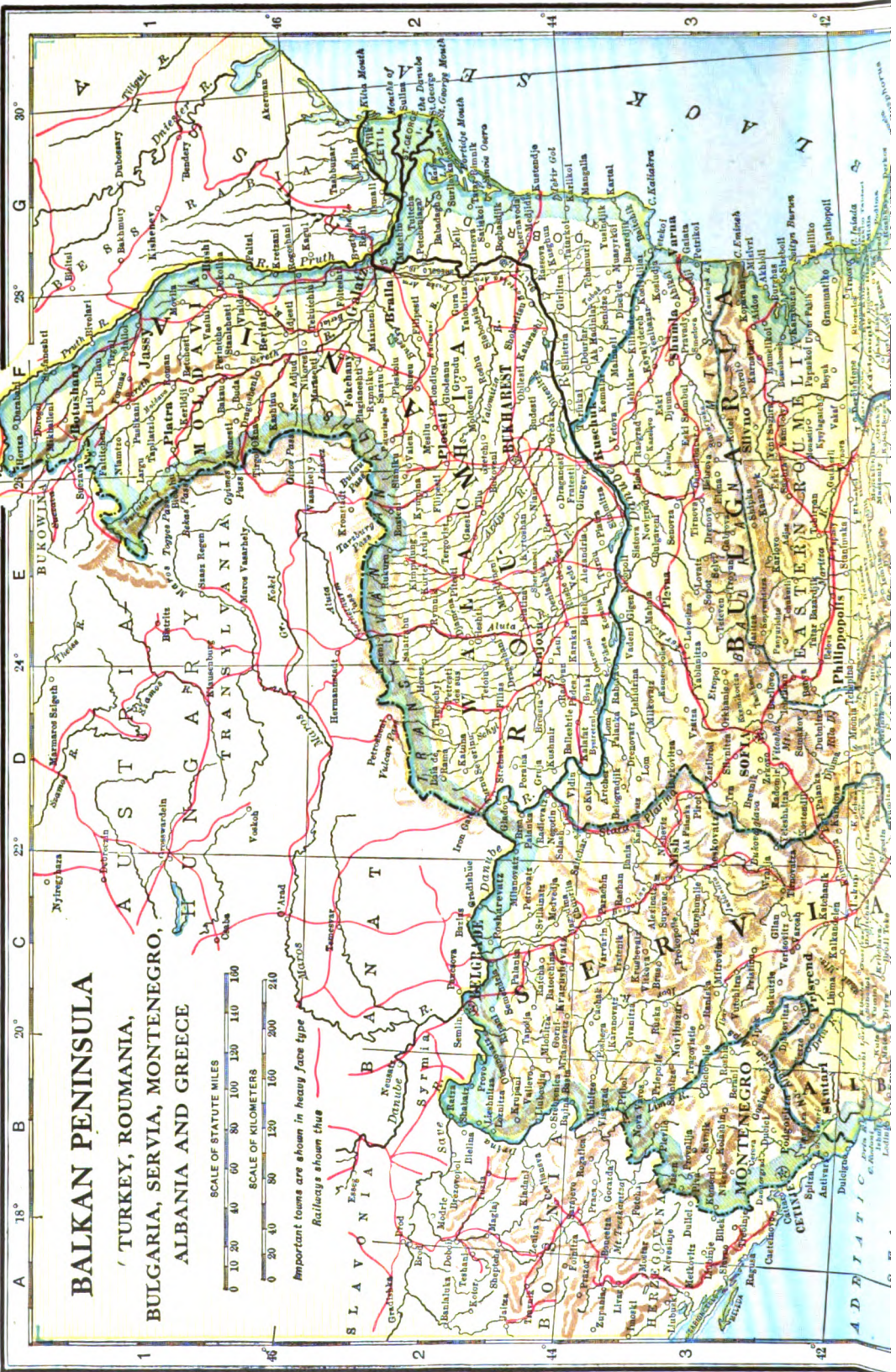
*(16) Rumania's Intervention (August).*

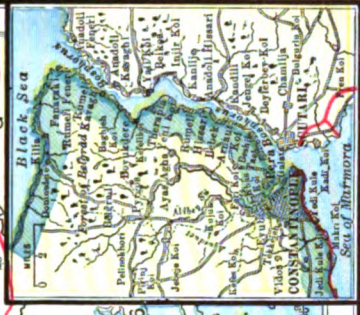
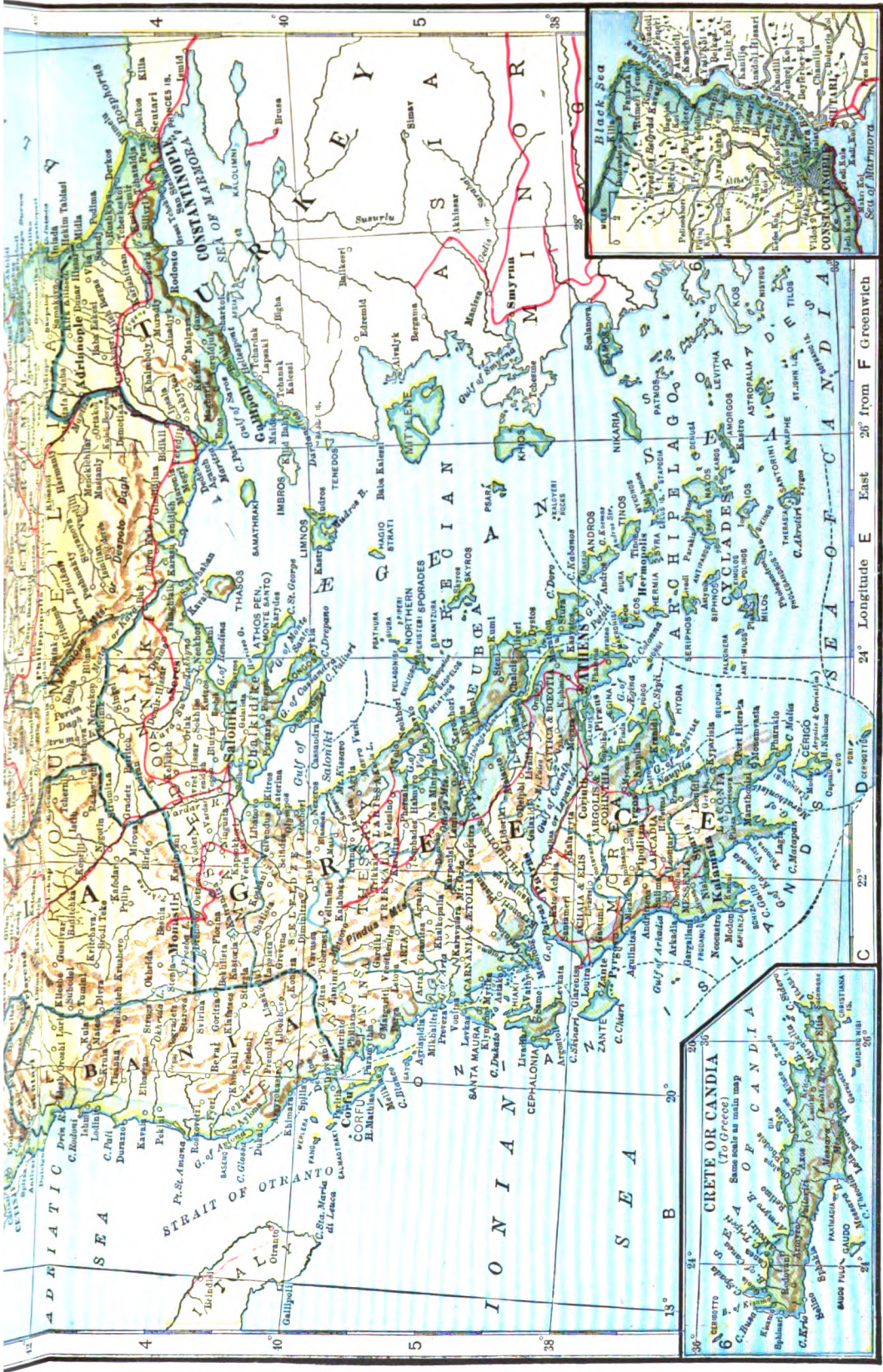
In the European theatres of war, the situation of the Entente Allies appeared most favorable in July and August, when the Anglo-French armies in France were conducting their great offensive on the Somme, when the Germans were abandoning their costly attacks on Verdun, when the Italians were storming the Gorizia fortifications and swarming up the western rim of the Carso plateau, when victorious Russian armies were penetrating ever more deeply into Volhynia and Galicia and threatening to pour through the Carpathian passes into Hungary. These impressive demonstrations of the Entente's military power convinced the Rumanian government, which had long been wavering in its policy of "expectant neutrality," that at length the time had come for intervention (see above, III, *Rumania and Austria-Hungary*). In conjunction with the Russian General Lechitsky's army (see above, section 11), which had occupied the Bukowina and southeastern Galicia, Rumania's forces would cross the Carpathians and march triumphantly into Hungary "to deliver from foreign domination" (in the words of King Ferdinand's proclamation to his people) the long-coveted provinces of Transylvania and the Banat, where dwelt some three million Rumanians under Hungarian rule. "We set forth in the struggle," said King Ferdinand, "with the enthusiasm of a people which has unshakable faith in its destinies."

Rumania's plan of campaign was dictated both by strategic and by political considerations. Strategically, Rumania was in a position either to cooperate with the Russians by invading Transylvania and striking into the Hungarian plain, behind the Carpathian barrier, or to cooperate with General Sarrail's Saloniki army in a joint attack on Bulgaria. The latter plan, if successfully executed, would have the threefold effect of crushing Bulgaria, cutting Turkey off from the Central Powers, and opening a route by which the accumulated surplus of Rumanian and Russian wheat could be freely exchanged for sorely-needed British and American munitions; but in attempting to invade Bulgaria the Rumanians would have to encounter two serious obstacles—the Danube River, which forms the frontier for almost 250 miles, and the Balkan Mountains, which lie south of the Danube; moreover, if Rumania sent the bulk of her small army (only five army corps were immediately available, and the total war strength was less than 600,000) south across the Danube, her northwestern frontier, 470 miles long, could not be adequately defended. If, on the other hand, Rumania merely stood on the defensive against Bulgaria, the Danube's broad stream could be easily guarded, while the main weight of the Rumanian army was flung against Transylvania. This course, in fact, was precisely the one which the Rumanian general staff elected to pursue; not only were the military hazards of a campaign against Transylvania smaller than the risks of a campaign against Bulgaria, but the political desirability of a Transylvanian offensive was infinitely greater. In conquering Transylvania, Rumania would be immediately realizing the cherished dream of "Greater Rumania"; she would be achieving the very object for which she entered the war.

No sooner had the Rumanian declaration of war been dispatched to Austria-Hungary, August 28th (see above, III, *Rumania and Austria-Hungary*), than Rumanian troops opened their attack all along the Hungarian or Transylvanian border. The Hungarian plain, it will be observed, is naturally protected on the north and east by the great curve of the Carpathian range, flanked on the south by the Transylvanian Alps, which sharply bend back westward from the southern extremity of the Carpathian range. In the acute angle between the Carpathians and the Transylvanian Alps, and half surrounded to the east and south by Rumania, lay the mountainous country of Transylvania, once an independent principality, now an integral part of Hungary. On the map, Rumania bears some resemblance to the open jaws of a pair of gigantic pincers—Moldavia forming the upper jaw, Wallachia the lower—with Transylvania caught in between them. It was the purpose of the Rumanian general staff that Transylvania should be crushed by the simultaneous pressure of both jaws. Accordingly, the Rumanians pressed heavily on both the Wallachian and the Moldavian front. From Moldavia, the Rumanians swiftly penetrated the four important passes (Tölgyes, Bekas, Gyimes, and Ojtoz) leading through the Carpathians into eastern Transylvania, and within less than a fortnight they had reached the valley of the upper Maros and the upper Alt (or Aluta), behind the Carpathian ridge, and about 20 miles inside the frontier. The strategic railway which traverses this valley was cut at Olah Toplitz (west of Tölgyes Pass), at Ditro (west of Bekas Pass), at Csik Szereda (west of Gyimes Pass), and at Sepsi Sz. György (south-west of Ojtoz Pass). During the latter half of September the advance from the direction of Moldavia continued; striding across the upper Alt, the Rumanians reached Homorod, Udvarhely, and Parajd, about 50 miles west of the frontier, while their northern flank, supported by the Russians, was brought close to Bistritz. Meanwhile the Rumanian armies on the Wallachian front had been closing in on Transylvania from the south. On their extreme left flank, the Rumanians had passed the "Iron Gates" of the Danube, taken Orsova, and marched northward along the railway to Mehadia. A second column from western Wallachia had made its way through Vulcan and Szurduk passes, captured Petroseny, and pushed northwards to Hatzeq, 25 miles inside the frontier. A third column, further east, had marched up the Oltu valley, through Rothenthurm (Red Tower) Pass, to the important town of Hermannstadt, the occupation of which was affirmed by the Rumanians, and denied by the Austrians. Still further east, Rumanian forces from Törzburger, Tömös, and Bodza passes had overrun the uplands where the Transylvanian Alps meet the Carpathians and had captured Kronstadt (Brasso), about 5 miles inside the frontier and 70 miles east of Hermannstadt. Between Kronstadt and Hermannstadt, the Rumanians captured Fogaras, and ventured northward to within 5 miles of Schässburg, a town almost 50 miles north of the frontier. A line drawn through Mehadia, Hatzeq, Hermannstadt, Schässburg, Udvarhely, Parajd, and Bistritz represents approximately the extreme limit reached by the Rumanian invasion in Septem-







24° Longitude E East 26° from F Greenwich



ber. About one-fourth of Transylvania had been "delivered" from Magyar rule. Almost 7000 prisoners had been taken. But even while the Rumanians, flushed with victory, were still deep in Transylvania, signs were at hand of an impending Teutonic counter-stroke. Germany had sent two of her ablest strategists, Falkenhayn and Mackensen, to the Rumanian front, and had the Rumanian air-scouts ventured far behind the Austrian lines they would have seen, at Temesvar and other Hungarian railway centres, grim howitzers and immense stores of munitions accumulating ominously.

(17) *Hindenburg in Power.*

For the Central Powers, the summer of 1916 was a period of bitter disappointment. The tremendous German effort at Verdun (February-July) had won a few ruined forts and desolated villages, but not victory; after July 1st, when the Anglo-French drive on the Somme began, the Germans seemed unable even to hold their own on the western front; the Austrians, likewise, after attempting an offensive (May) on their western front—against Italy—had been thrown back on the defensive and had been driven out of Gorizia (August); the eastern front, weakened to supply men for the Teutonic offenses against Italy and France, had been battered in by the Russians (June-August); and at the close of August the intervention of Rumania had added 600,000 bayonets to the "ring of steel" surrounding the Central Powers and 900 miles to the front which the Central Powers had to defend. Such were the disastrous results of the strategy pursued during the first half of the year 1916 by Gen. Erich von Falkenhayn, chief of the German general staff (see YEAR BOOK for 1914, p. 765, note). The dismissal of von Falkenhayn August 29th, betokened a radical revision of German strategy. The most brilliant of German field-commanders, Field Marshal Paul von Beneckendorff und von Hindenburg, hero of Tannenberg (see YEAR BOOK for 1914, p. 771), conqueror of Russian Poland (see YEAR BOOK for 1915, pp. 713-715), and commander in chief of the German armies on the Russian front, was chosen to succeed von Falkenhayn as chief of the general staff. Ludendorf, who had formerly been von Hindenburg's chief of staff on the Russian front, now became quartermaster-general and was recognized as "von Hindenburg's right hand man." The effects of von Hindenburg's appointment were soon apparent. The command of the armies on the western front was reorganized, with Field Marshal Duke Albrecht of Württemberg as commander of the northern army group, Crown Prince Rupprecht of Bavaria as commander of the central group (including the region of the Somme), and the Prussian Crown Prince in charge of the Verdun army group. On the Russian front, Prince Leopold of Bavaria and the Austrian Archduke Charles Francis were the titular commanders of army groups, but operations were really directed by trusted German staff officers. At the German headquarters behind the eastern front important conferences were held in September and probably at that time the decision was made to undertake a great offensive against Rumania. Field Marshal von Mackensen, who had coöperated with von Hindenburg in the great Austro-Ger-

man invasion of Russia in 1915, and had subsequently superintended the conquest of Serbia, in October and November, 1915, unexpectedly appeared in the second week of September, 1916, as commander of a composite Bulgar-Turco-Teutonic army attacking Rumania from the south, while von Falkenhayn, about the same time, was mentioned in the official *communiqués* as commander of the Austro-German armies on the Transylvanian front. The plan for the invasion of Rumania, probably conceived by von Hindenburg in September, was successfully executed in the following months; it was one of the most brilliant campaigns of the war (see detailed narrative below); and it earned von Hindenburg a personal letter of congratulation from the German Emperor as well as the enthusiastic plaudits of the German nation. Nor was von Hindenburg content merely to plan campaigns. He intervened in the debate regarding the "unleashing" of the U-boats, and reproved the extremists who advocated ruthless submarine warfare; he induced the Emperor to nominate as war minister General von Stein, who had gained practical experience as an army commander on the western front; and he publicly indorsed, if, indeed, he did not initiate, the plan of industrial conscription, which was adopted by the Reichstag in December, for the purpose of tremendously expanding Germany's output of munitions. With von Hindenburg in power, Germany prepared to match strategy and efficient industrial organization against the Allies' ill-utilized numerical superiority.

(18) *The Collapse of Rumania (September-December).*

When Rumania entered the war, King Constantine of Greece predicted that Rumania's temerity would speedily be punished by a swift and irresistible German drive, and that Rumania would share the tragic fate of Serbia. The Rumanian general staff, however, too confident of an easy victory, gave little heed to Constantine's warning. Relying upon General Sarrail in Macedonia to engage the attention of Bulgaria, and counting upon Russia to prevent the shifting of Austro-German troops from the Russian front, the Rumanian general staff threw all available forces into Transylvania, with little regard for the possibility of counter-attacks. Rumania's rashness was her own undoing.

On September 2nd, six days after the Rumanian declaration of war, three Bulgarian columns (with some Turkish and German units) crossed the border from Northern Bulgaria into Rumanian Dobrudja, on the 100-mile front between the Danube and the Black Sea. The easternmost column, near the coast, captured the fortress of Dobritch (Bazardjik) after a bitter contest, September 3rd-8th, and occupied the seaports of Baltchik (September 8th), Kavarna (September 8th), and Mangalia (September 10th). The central column marched by way of Akkadunlar (September 2nd) and Afatar (September 8th) to the Danube fortress of Silistria (September 9th). The western column stormed the fortified town of Turtukai (Tutrakan) on the Danube, 30 miles west of Silistria, on September 6th, capturing 25,000 men. By September 15th the invaders had reached the line Raso-va-Toprai Sari-Tuzla, about 50 miles north of

the Bulgarian frontier; there they were temporarily held in check by four Rumanian divisions, two Russian divisions, and three Russian cavalry divisions. The fortnight's fighting had brought the Bulgarians to within 10 miles of the very important Constanza-Chernavoda railway, which connects Bucharest with Constanza, the most important seaport of the Dobrudja.

While Field Marshal von Mackensen paused on the Rasova-Tuzla line, General von Falkenhayn, on the Wallachian front, dealt the unwary Rumanian invaders of Transylvania a series of shrewd blows. First at Hatzeg (60 miles west of Hermannstadt), he repulsed a Rumanian column, recaptured Petroseny with its valuable iron mines, and expelled the Rumanians through Vulcan Pass, September 19th-23rd. The following week, the Rumanian first army, advancing north of Rothenthurm Pass, in the direction of Hermannstadt, was suddenly enveloped by German forces, which had secretly marched through the mountains and cut the Rumanian communications at Rothenthurm Pass; in the battle that ensued south of Hermannstadt, September 26th-29th, the Rumanians were completely routed. The Rumanian disaster at Hermannstadt uncovered the left flank of the Rumanian second army, which had been attempting to envelop Schässburg; and compelled the Rumanians hastily to evacuate Kronstadt, October 8th. The Rumanians were trapped in the Transylvanian mountains in almost exactly the same manner as the Italians had been trapped in the Trentino mountains. In confusion, the Rumanian columns in Eastern Transylvania fled toward the Rumanian frontier. By October 16th the Rumanians had been driven back all along the line; Transylvania had been cleared, and the Austro-German armies were battling for the passes on the Rumanian frontier. South of Törzburg and Tömös passes, in fact, the Germans already stood on Rumanian soil.

By this time, von Mackensen had brought up a sufficient number of big guns to break through the Russo-Rumanian lines south of Chernavoda-Constanza railway, at Toprai Sari, Cobadin, and Tuzla, October 19th-21st. Bulgarian cavalry dashed into the city of Constanza, October 22nd, just eight weeks after Rumania's entry into the war. Routed in a desperate struggle at Medjidia, midway between Constanza and Chernavoda, the Russians and Rumanians abandoned the whole line of the railway and evacuated the town of Chernavoda. On the very day that the Bulgars entered Chernavoda, Mr. David Lloyd George informed the British House of Commons, "We and our Allies are working in concert and everything that is possible is being done to help Rumania." Russia sent one of her ablest generals, Vladimir Sakharov, with reinforcements to stiffen the Dobrudja line; but the Constanza-Chernavoda line was irretrievably lost, and the best Sakharov could do was to reorganize the shattered Russo-Rumanian army in the northern Dobrudja. Von Mackensen's advanced guard, which had reached a point 40 or 50 miles north of the Constanza-Chernavoda railway, fell back in November to a position 10 or 12 miles north of the railway.

While military critics were eagerly discussing von Mackensen's victory in the Dobrudja, the main weight of the Austro-German offensive

was concentrated against the opposite front. South of Vulcan Pass, which he had captured on October 25th, General von Falkenhayn suddenly burst through the Rumanian line and swept down the Jiul Valley, in Western Wallachia, overwhelming the Rumanians in a bloody battle, November 15th-17th, at Tirgujiulij (about 20 miles south of Vulcan Pass), reaching the Orsova-Craiova railway, 50 miles south of Vulcan Pass, on November 19th, and capturing Craiova, 75 miles south of the frontier, two days later. By this swift stroke von Falkenhayn won the western third of Wallachia. The Rumanian force operating in the extreme west, finding itself completely cut off from the other Rumanian armies, hastily evacuated Orsova and Turnu-Severin and retired into the mountains near by, but was soon compelled to surrender. With frantic haste the Rumanian general, Averescu, endeavored to marshal his demoralized army behind the Alt (Aluta or Oltau) River, and turned at bay, facing westward, 90 miles west of Bucharest. But the line of the Alt was turned on both flanks. From the north, Austro-German armies advanced through Rothenthurm and Törzburg passes down the slopes of the Transylvanian Alps into the Wallachian plain, behind the Alt. On the south, Field Marshal von Mackensen flung strong forces across the Danube at Islacz (at the mouth of the Alt), at Simnitzer (35 miles further east), and at Giurgevo; by November 25th von Mackensen had reached Alexandria. With both flanks crumpling, the Alt line was no longer tenable, and the Rumanians fell back to their last line of defense, the Arges River, less than 10 miles west of Bucharest. So swiftly, however, did von Falkenhayn's ninth army advance eastward from Craiova that it reached the railway junction of Titu, 90 miles northeast of Craiova and five miles behind the Arges line, about December 3rd, and threatened to envelop Bucharest from the north. Simultaneously von Mackensen, who had assumed supreme control of the Austro-German-Bulgar operations in Wallachia and Dobrudja, crossed the Arges south of Bucharest. With its supposedly invulnerable cincture of 36 armored forts and redoubts, constructed by the famous Belgian engineer, Brialmont, Bucharest was one of the most formidable fortresses in Europe, but the Rumanians made no serious attempt to defend the city against von Mackensen's heavy howitzers. On December 6th—his birthday—von Mackensen entered Bucharest in triumph; his path was strewn with flowers by the Teutonic residents of the Rumanian capital. On the same day, the city of Ploechti (30 miles north of Bucharest) and the whole line of the Bucharest-Kronstadt railway fell into the invader's hand. In the three weeks' campaign, November 15th-December 6th, von Falkenhayn and von Mackensen had routed the Rumanian army, taken about 80,000 prisoners, and conquered the greater part of Wallachia. A violent Russian counter-attack in the Carpathian region failed to stay the Austro-German advance in Rumania, although, according to Austrian reports, the Russians sacrificed 30,000 men in one week. The German Ninth Army drove irresistibly eastward, from Ploechti to Urziceni and Mizil, December 12th—taking 10,000 prisoners in three days—and from Mizil to Buzeu, December 16th. Simultaneously, strong Bulgarian forces crossed the Danube at



Turtukai, Silistria, and Chernavoda, and swept northward to the Jalomitza River, where the Rumanians were again defeated. By the close of December, the Rumanians had been driven out of Wallachia and were standing at bay on a line southwest of Fokshani and Braila, defending Moldavia. In the Dobrudja, the Bulgarians had meanwhile driven Sakharov's Russo-Rumanian army into the extreme northwestern corner, on the narrow tongue of land in the loops of the Danube east of Braila and Galatz.

At the close of the year, it was obvious that the net result of Rumania's intervention had been favorable to the Central Powers. Austro-Hungarian confidence and German prestige, shaken by the failures at Verdun, on the Somme, in Volhynia, in Galicia, in the Bukowina, and on the Isonzo, were restored by the spectacular campaign in Rumania. To be sure, the battle front was approximately 200 miles longer than before Rumania's intervention, but actually fewer men would be required to oppose, or to pursue, the shattered fragments of the Rumanian field army, which had lost at least two-thirds of its effectives, than had previously been required to guard 900 miles of frontier with Rumania's long-delayed intervention an uncertain but no less a real menace. Moreover, a large quantity of Rumanian wheat, which British agents had purchased to prevent its exportation to the Central Powers, was now in the possession of von Mackensen, or rather, of Gen. Tuelff von Tschefe und Woidenbach, who had been appointed military governor of the conquered area.\* The fertile grainfields of Wallachia, scientifically cultivated under the supervision of German experts, might be counted upon to relieve the shortage of bread in Austria and Germany, in case the war should be prolonged over another harvest season. Nor should it be forgotten that in capturing the Rumanian city of Ploechti, in the Prahova Valley, the Germans won the centre of one of Europe's richest oil-fields, although the oil-wells were found in flames and the oil-tanks destroyed. The economic results of von Mackensen's campaign were as important as its strategy was brilliant.

#### (19) *The Situation in Macedonia.*

The collapse of Rumania was in part due to the failure of General Sarrail to exert sufficient pressure on the Macedonian front; Sarrail's inaction enabled the Bulgars to transfer troops and guns from Macedonia to Dobrudja in order to assist in the Austro-German invasion of Rumania. General Sarrail, it will be recalled (see YEAR BOOK for 1915, p. 717), was the French officer entrusted with the command of the Allied armies in Greek Macedonia. Since the ill-fated Anglo-French expeditionary force had been expelled from Serbia in December, 1915, French, British, Serbian, Italian, Russian, and Albanian reinforcements had been landed at Saloniki, so that by the end of August Sarrail had at his disposal a very formidable army of 700,000 men. The Allied forces were flung out on a fan-shaped front in Greek Macedonia north of Saloniki; the left of the Allied army was close to the Serbian frontier in the mountains south of Monastir; the centre was pushed up the Vardar

\* The Dobrudja was placed under Bulgarian administration.

Valley to the border towns of Gievgheli and Doiran, 40 miles north of Saloniki; the right wing rested on the Struma River and Lake Tachyno, but its outposts had been advanced even further to the northeast. No important fighting occurred on the Macedonian front during the first six months of 1916, although in May the Bulgars seized Fort Rupel and several other Greek posts northeast of Saloniki, and in July the Serbs engaged the Bulgars near Florina, south of Monastir. On August 21st, however, the French War Office announced that "on August 20th the Allied forces at Saloniki took the offensive on the entire front." The "offensive" was either a sham or a fiasco. Instead of driving northward into Serbia, Sarrail actually lost ground. His left wing was beaten back from Florina (August 18th), and the Bulgars in this sector occupied Ekshisu Station (on the railway between Florina and Saloniki), Koritza (just across the Albanian frontier, southwest of Monastir), and Kastoria (about 35 miles south of Monastir), August 23rd. At the same time, on Sarrail's right wing the Bulgarian troops seized the railway between Drama, Seres, and Demir-Hissar, August 20th-25th, and occupied the Greek port of Kavala, September 12th. The Greek garrison of Kavala was transported to Germany in quasi-captivity. The months of October, November, and December—so disastrous for Rumania—witnessed no significant operations on either the right wing or in the centre of Sarrail's line; skirmishes, however, were of daily occurrence, and several unimportant villages in the Struma valley were captured, lost, and captured again by British troops. On the right wing, however, the reorganized Serbian army of 120,000 men unrelentingly fought its way, mile by mile, northward toward Monastir. About the middle of September the Serbians recaptured Ekshisu Station, stormed Malka Nidza Ridge between Florina and Lake Ostrovo, and drove the Bulgarians back to the Brod River, just south of the frontier. Russian and French detachments, supporting the left flank of the Serbian army, expelled the Bulgarians from Florina, 18 miles or so south of Monastir, September 18th. While the Franco-Russian column advanced by way of Kenali as if to deliver a frontal attack on Monastir, to the Serbians was assigned the very arduous task of fording the Brod, scaling the lofty summit of Kaimakcalan Mountain, storming Starkov Grob Ridge, fording the Tchernia River, and dragging their mountain-guns across country to the hilltops in the bend of the Tchernia, where they could shell the Bulgarians out of Monastir. Two months elapsed, September 15th-November 15th, while the Serbians, grimly fighting all the way, plodded northward, over bleak hills and across dreary ravines, until they reached the heights in the bend of the Tchernia, east of Monastir. Thereupon the Bulgarians evacuated Monastir and early in the morning of November 19th French cavalry rode into the town. It was exactly four years since Monastir had been captured from Turkey by the Serbs, and almost one year since it had been occupied by the Austrians and Bulgars. A few miles north of Monastir the Allied advance came to a standstill and during the ensuing weeks military critics looked in vain for a serious attempt by Sarrail to relieve the pressure which was crushing Rumania.

In order to protect the exposed left flank of Sarrail's Macedonian army—and possibly for political as well as military reasons—Count Cadorna sent reinforcements to General Piacentini's army at Avlona (see above, IV, 2), with instructions to occupy all southern Albania. Accordingly, Italian detachments took possession of Tepelini, August 30th, Klisura, October 8th, Premedi, October 9th, and Lyaskoviki, close to the Greek border, October 20th. A French *communiqué* on October 25th announced that the cavalry on the left wing of Sarrail's army was in touch with Piacentini's forces. (See also, III, *Relations Between Greece and the Entente*, above; and separate article, GREECE.)

(20) *The French Counter-Stroke at Verdun (October–December).*

While every day was bringing news of stirring events in Transylvania, in the Dobrudja, in Macedonia, or on the Somme, Verdun almost disappeared from the *communiqués*, the struggle on the Heights of the Meuse seemed to have been abandoned. Then, quite unexpectedly, General Nivelle launched a furious attack on the east bank of the Meuse, north of Verdun, broke through the German line on a 4-mile front, to a maximum depth of 2 miles, and by a single stroke recaptured Douaumont village, Douaumont Fort, Thiaumont Farm and Redoubt, and Haudromont quarries. More than 3500 Germans were taken prisoners in a single day. The German War Office, in admitting the reverse, explained that Fort de Douaumont was really evacuated because the benzine stores there had caught fire. General Nivelle followed up his success by recapturing Fort de Vaux—which the Germans evacuated on November 2nd without waiting for the French infantry attack—Damloup village, and Vaux village, November 5th. To offset these further losses, the German War Office announced that German troops had stormed the summit of Hill 304, west of the Meuse, December 6th. France, on the other hand, rewarded Nivelle with promotion to the chief command\* of all the French armies on the Western front, December 11th. The success of Nivelle's sudden stroke at the close of October may possibly be ascribed to the element of surprise, but some other explanation must be sought for the success of the second French counter-stroke at Verdun, December 15th–16th. Several days' artillery preparation advertised the attack. This time, the Germans were not taken unawares. But the December attack, under the direction of General Mangin, was hardly less successful than the October attack, under Nivelle. The German trenches were car-

\* At the beginning of the war the chief command in France had been wielded by General Joffre; his supreme control had been extended also over the French forces in the Near East, Dec. 2, 1915; on Dec. 11, 1916, he was relieved of his duties as commander in chief, and was given a dignified position as technical adviser to the French War Council, formed on Dec. 13 (see FRANCE, *History*); and General Nivelle was made commander in chief of the French armies in France ("northern and northeastern armies"), while General Sarrail remained in charge of the "army of the east," at Saloniki. France had three war ministers in 1916: General Gallieni, "defender of Paris," who had succeeded Millerand in November, 1914, and who resigned in March, 1916, a few weeks before his death; General Roques, from March, 1916, to December; and finally General Lyautey, Dec. 13, "conqueror of Morocco" and military disciple of Gallieni.

ried on a front of 6¼ miles; more than 9000 prisoners were taken; 81 guns were taken or destroyed; and the villages of Vacherauville, Louvemont, and Bezonvaux, together with the field-works of Hardaumont and Bezonvaux, the farm of Chambrettes, and part of Caurières Wood, were captured by French troops. Although the territory regained by these two French counter-strokes represented only a small part of what had been lost between February and July, the significance of the French exploit can hardly be exaggerated. With trifling sacrifice of men, the French had easily regained the most important strategic positions on the east bank of the Meuse—positions which the Crown Prince had captured only after desperate, protracted, and frightfully sanguinary battles. The work of the French artillery in October and December was especially noteworthy; as photographs of Fort de Douaumont demonstrated, the French bombardment was incomparably more effective than the German bombardment of the same place had been in the earlier phase of the struggle. Most important of all, the French counter-stroke indicated the military superiority of the Allies on the Western front; Field Marshal von Hindenburg, it appeared, had determined, for the time being at least, to pursue the inglorious but prudent course of yielding trench after trench in the West in the hope of winning spectacular victories in the East.

(21) *Conquest of Kamerun and German East Africa.*

Inexorably the conquest of the German colonies proceeded, unperturbed by events in Europe. Kiaochow and Kaiser-Wilhelmsland, in the Far East, had been taken by Japanese and British forces in 1914; two of the German African colonies—Togoland and German Southwest Africa—had been taken in 1914 and 1915, respectively; so that at the beginning of the year 1916 only two colonies remained—Kamerun and German East Africa.

In Kamerun the German force, after a stubborn fight in 1914–15, was finally overwhelmed in 1916 by the irresistible convergence of a British column from Nigeria, a Belgian column from Congo, and French columns from Ubangi and from Congo. From the central part of the colony, the Germans fled southward toward the neutral territory of Spanish Guinea, hotly pursued by the invaders, who occupied Yaunde on January 1st and Ebolowa on January 10th. With 900 Germans and 14,000 negro soldiers, General Zimmermann early in February made good his escape into Spanish Guinea, whence he was transferred to Spain for internment. A few days later, February 18th, the last isolated German detachment surrendered, at Mora Hill (in the extreme northern section of Kamerun). The colony was partitioned by France and Great Britain, the greater part being placed under the administration of the French General Aymerich.

To German East Africa the Allies next turned their attention. Despite frequent attacks, little or no headway had yet been made toward the conquest of this, the last and the most important of the German colonies in Africa, stoutly defended by 4000 white and 30,000 negro soldiers. In the spring of 1916, however, British South Africa sent a powerful Boer army under

the command of General Jan Christian Smuts\* to invade German East Africa from the north, using British East Africa as a base of operations. Crossing the border in February, General Smuts fought his way around the forested slopes of the mighty mountain of Kilimanjaro and advanced through almost impassable jungles down the Pangani River valley; by July 10th the entire railway from Tanga, on the coast, to Moshi, near Kilimanjaro, was in his possession. Another British column from the north struck into the very heart of German East Africa, capturing Kondoa-Irangi in June and Kilimatinde in July. Simultaneously a Belgian detachment, under General Tombeur, invaded the colony from the northwest, and reduced the chief German stronghold, Tabora, on September 11th. On the west the Germans were assailed by British columns from Nyasaland and Rhodesia, and on the south by Portuguese troops from Mozambique. Most of the coast towns, including the capital, Dar-es-Salaam (September 3rd), were taken by combined naval and military attacks in September. Before the close of the year the main German forces were driven into the mountainous region south of the great central railway (Dar-es-Salaam to Ujiji), but not entirely annihilated. The major portion of the colony was occupied by the Allies.

#### (22) Estimated Casualties.

Though untrustworthy, the estimates of the casualties suffered by the belligerent nations are not without interest. The *New York Times* estimated the total number of casualties from August, 1914, to January, 1917, at 19,000,000; the number of killed, at about 4,750,000; the daily cost of the war, at \$100,000,000 or more. By counting the names on German casualty lists the British War Office reached the conclusion that the total German losses, in killed, captured, wounded, and slightly wounded, amounted to 4,010,160 for the first 29 months of the war; about one-fourth of the total were killed. France captured 78,500 Germans in 1916. A German report placed the total casualties suffered by France at 3,800,000; by Great Britain, 1,300,000. About the same figures were given by Danish statisticians, December 5th: British casualties, 1,200,000; French, 3,700,000; Russian, 8,500,000; Italian, 800,000; Serbian, 480,000; Belgian, 220,000; Rumanian, 200,000; total for the Entente, over 15,000,000.

#### V. NAVAL OPERATIONS

##### *The Naval Battle of Jutland (May 31).*

This, the first really important naval battle of the war, fought in the North Sea, off Jutland coast, on May 31, 1916, is described in the article NAVAL PROGRESS.

##### *Minor Naval Losses.*

Besides the Lowestoft raid and the Jutland battle, no other naval engagements of importance occurred during the year. Several warships were destroyed by mine, torpedo, or internal explosion. In this way Great Britain lost the

battleship *King Edward VII*, January 9th, by a mine-explosion; the battleship *Russell*, April 27th, by mine-explosion, in the Mediterranean; the cruiser *Hampshire* (with the war minister, Lord Kitchener on board), June 6th; the light cruisers *Nottingham* and *Falmouth*, August 19th; and several destroyers and lesser craft. France lost the cruiser *Amiral Charner*, February 13th; the transport *Provence*, with 3100 men, in the Mediterranean, February 27th; the destroyer *Renaudin*, March 18th; and the battleship *Suffren*, with 700 men, December 8th.

Among the Italian warships destroyed were the transport *Principe Umberto*, June 9th, and the superdreadnought *Leonardo da Vinci* (22,000 tons), with 300 men, on August 2nd. Several Russian transports were sunk in the Black Sea by the Turkish cruisers *Midullu* and *Sultan Selim*, and the big battleship *Imperatrice Maria* (22,500 tons) was destroyed by explosion (?) on October 20th. The Allies reported the sinking of several German destroyers and torpedo boats, a light cruiser of the *Kolberg* class, and a battleship of the *Nassau* class. A German estimate in December placed the total number of Allied warships destroyed during the war at 192, and the tonnage at 744,000; according to another estimate the Allies had lost 115 ships, of 586,705 tons, as compared with the 122 ships, of 387,911 tons, lost by the Central Powers.

##### *Submarines and Commerce-Raiders.*

There were three very potent reasons for Germany's continuance of submarine warfare against Allied merchantmen and neutral contraband-carriers. In the first place, many shipments of munitions were sunk, and many more delayed, by the U-boat campaign. Secondly, the destruction of a very considerable number (almost 1000 in 1916) of Allied merchantmen caused the Allies very serious inconvenience if it did not actually hamper their military operations, because a large part of the Allied merchant marine had been withdrawn from ordinary commerce and devoted to military purposes. The drastic measures taken by France and Great Britain to restrict bulky and unnecessary imports, the seizure of German merchantmen by Portugal and Italy, and the earnest attention given by the great Paris War Council (see above, III) to the problem of the inadequacy of maritime transportation facilities, all testified to the importance of the German submarine campaign. And, in the third place, the jingoistic elements in Germany, incensed by the British blockade, vehemently insisted upon submarine warfare as the only effective means of retaliating for Great Britain's attempt to starve the civil population of Germany. Since by arming their merchantmen the Allies had endeavored to combat the German U-boat menace, the Central Powers announced on February 8th that beginning on March 1st their submarines would be instructed to attack without warning any enemy merchantman mounting cannon. Armed merchantmen would be regarded virtually as belligerent warships. Neutral powers should warn their subjects not to travel on armed merchantmen of belligerent nationality. Among the neutral powers, Sweden complied with the Austro-German request, but the United States, after some hesitation (see article, UNITED STATES AND THE WAR), returned a flat refusal. Nevertheless,

\* General Sir Horace Smith-Dorrien, at first selected to lead the invasion, fell sick and resigned his command to General Smuts.

the Central Powers persisted in their intention, and in March a number of merchantmen were torpedoed without warning. The sinking of the Norwegian liner *Silius* and the Dutch vessels *Tubantia* and *Palembang*, involved Germany in disputes with Norway and the Netherlands. The sinking of the British passenger-vessel *Sussex*, on March 24th, with 50 passengers (including several Americans) resulted in an angry altercation which strained relations between Germany and the United States (q.v.) almost to the breaking point. In deference to President Wilson's insistent demands, the German government on May 4th promised that henceforth no merchantmen would be sunk without warning or without due provision for the security of passengers' lives, except when a merchantman attempted flight or resistance. That this declaration, important as it undoubtedly was, did not mean the cessation of submarine warfare is proved by the list of vessels sunk: January, 12 Allied and 4 neutral merchantmen, with 231 lives lost; February, 16 Allied and 3 neutral merchantmen, with 115 lives lost; March, 21 Allied and 13 neutral merchantmen, with 34 lives lost; April, 70 allied and 26 neutral merchantmen, with 155 lives lost; May, 56 Allied and 4 neutral merchantmen, with 48 lives lost; June, 61 Allied and 7 neutral merchantmen, with no lives lost; July, 50 Allied and 9 neutral; August, 126 Allied and 35 neutral; September, 141 Allied and 39 neutral; October, 146 Allied and 72 neutral; November, 152 Allied and 68 neutral. The British Admiralty, however, asserted that the German pledge was being flagrantly violated; on November 19th a list was published of 22 British ships alleged to have been sunk without warning, and of 107 vessels torpedoed without due provision for the safety of the passengers.

A novel, but not a very feasible, method of nullifying the British blockade was suggested in July by the voyage of the *Deutschland*, a "merchant submarine," unarmed, across the Atlantic from Germany to the United States. Successfully eluding vigilant Allied warships, Capt. Paul Koenig not only made the return trip to Germany in safety, but reappeared in an American port, with a second cargo from Germany, in December. The *Deutschland* was not the only German submarine to brave the perils of the long transatlantic journey. The *U-53*, a German war submarine, entered the harbor of Newport, R. I., on October 7th, delivered a letter for the German ambassador, and torpedoed 3 British, 1 Dutch, and 1 Norwegian steamship just outside the 3-mile limit.

One of the most adventurous exploits of the German navy was the cruise of Count von Dohna, in the commerce-raider *Moeve*. Having slipped through the British blockade, the *Moeve* succeeded in capturing 13 British, 1 French, and 1 Belgian merchantman, and returned to Germany, again evading the British warships by steering an unusual course around the north of Iceland, with 199 prisoners and 1,000,000 marks in gold on board. The *Greif*, attempting to emulate the *Moeve*, was sunk by the British warship *Alcantara*, February 28th.

#### VI. AERIAL WARFARE

Greater attention than ever before was given in 1916 to the "war in the air." Aëroplanes of

improved and powerful types were constructed in great number. Formidable fleets of gigantic aëroplanes, carrying tons of high explosive bombs, ventured on long journeys behind the enemy's battle line to rain destruction on arsenals, railway junctions, and centres of supply. Battle-planes, armed with machine-guns, and sometimes carrying one or more passengers with the pilot, daily engaged in thrilling individual combats, all along the front in France and Belgium, and, less frequently, on other fronts. Thanks to the generous recognition given their deeds by the official *communiqués*, several aviators became more famous than the commanding generals of armies. Lieut. Max Immelmann, one of the most successful German air pilots, was victorious in 15 duels before he met disaster on June 21st. Still greater was the renown of Captain Boelke, another German, whose custom it was to mount to a dizzy height and then, like some monstrous bird of prey, to swoop down upon his enemy. Victor of 40 air battles, Captain Boelke was killed himself on October 28th. Among the Allied aviators, one of the most eminent was the French Lieutenant Gwynemer, who brought down his 25th German aëroplane on December 27th. A British aviator, Lieut. W. L. Robinson, earned the Victoria Cross by winning an unequal combat with one of the giant German Zeppelins, September 3rd. Nor should mention be omitted of the French 2nd Lieutenant Marchal, who, starting at the French frontier, flew clear across Germany, bombarded Berlin with handbills, and never paused until he reached Russian Poland, after an uninterrupted flight of 800 miles (world's record). The interest in the war in the air was not purely romantic. Aëroplanes and airships were indispensable adjuncts of artillery and infantry; airscouts performed invaluable service by directing artillery fire, by observing enemy troop movements, and by photographing the enemy's trenches. While the importance of the aëroplane was enormously enhanced, the work of the Zeppelin was relatively futile. Thirty or more German air-raids on England in 1916 destroyed some property and killed several hundred civilians, but their chief effect was to arouse British public opinion against what seemed to be a policy of wanton slaughter. Thirteen Zeppelins were destroyed in 1916, making the total lost during the war about 50, according to English reports.

Other information bearing on the war will be found in the following articles: AGRICULTURE; BATTLESHIPS AND OTHER WAR VESSELS; CONTABAND OF WAR; FINANCIAL REVIEW; FOOD AND NUTRITION; INTERNATIONAL PEACE AND ARBITRATION; JEWS AND JUDAISM; MILITARY PROGRESS; NAVAL PROGRESS; RED CROSS; RELIEF FOR WAR VICTIMS; SHIPPING; SOCIALISM; SUBMARINES; SURGERY; UNITED STATES AND THE WAR; WOMAN MOVEMENT; WOMEN IN INDUSTRY; in the sections entitled *History*, under ALBANIA, AUSTRIA-HUNGARY, BELGIUM, BULGARIA, FRANCE, GERMANY, GREAT BRITAIN, GREECE, ITALY, RUSSIA, TURKEY. Attention is called especially to the significant cabinet changes in November and December in Great Britain, France, Austria-Hungary, Russia, and Germany, and to the revolt of Arabia against Turkey. See also articles on various industries affected by the war. For books relating to the war, besides those mentioned below, see LITERATURE, ENGLISH AND

AMERICAN; articles on French, German, Italian, Russian, Scandinavian, and Spanish Literatures; also the article PHILOSOPHY.

**Bibliography.** For a fairly extensive critical bibliography of the war, the reader is referred to the NEW INTERNATIONAL YEAR BOOK for 1915, pp. 726-729. Among the more recent books on the war, the following are of timely interest:

**CAUSES.** Beyens, *Germany Before the War* (New York); Yves Guyot, *Causes and Consequences of the War* (ib.); E. L. Hovelague, *Deeper Causes of the War* (ib.); G. W. Prothero, *German Policy Before the War* (ib.); G. L. Dickinson, *European Anarchy* (ib.); *Modern Germany in Relation to the Great War* (New York); F. Naumann, *Central Europe*.

**DIPLOMACY.** Arthur Bullard, *Diplomacy of the Great War* (New York); C. W. Hayward, *What is Diplomacy?* (London); E. R. O. von Mach, ed., *Official Diplomatic Documents Relating to the Outbreak of the European War* (ib.); C. Perkins, *Outline of Recent European History, 1875-1916* (ib.), contains a bibliography; J. B. Scott, *Diplomatic Documents Relating to the Outbreak of the European War* (2 vols., Oxford); Emile Waxweiler, *Belgium and the Great Powers*; R. W. Seton-Watson, *Rumania and the Great War*; E. J. Dillon, *From the Triple to the Quadruple Alliance* (London); C. Phillipson, *International Law and the Great War* (New York); J. W. Burgess, *America's Relations to the Great War* (Chicago).

**MILITARY.** *The Story of the Great War* (Collier); Sidney Low, *The War in Italy*; Norman Wilkinson, *The Dardanelles* (New York); John Masefield, *Gallipoli* (ib.); Briggs Davenport, *A History of the Great War* (ib.); Edgar Wallace, *The War of the Nations* (London); Raymond Recouly, *General Joffre and His Battles* (New York); John Reed, *The War in Eastern Europe* (ib.); S. Washburn, *Victory in Defeat* (ib.); Hilaire Belloc, *Elements of the Great War, the Second Phase, Battle of the Marne* (ib.).

**POLITICAL, ECONOMIC, AND SOCIAL.** W. S. McB. Knight, *A History of Great Britain During the Great War*; E. Meyer, *England: Its Political Organization and Development and the War Against Germany* (Boston); E. Ludwig, *Austria-Hungary and the War*; J. M. Robertson, *War and Civilization* (ib.); A. J. Toynbee, *New Europe* (New York); Israel Zangwill, *War for the World* (ib.); A. D. Hall, *Agriculture After the War* (ib.); A. D. Noyes, *Financial Chapters on the War* (ib.); Max Eastman, *Understanding Germany* (ib.); W. L. Mallaber, *Medical History of the Great War* (ib.); L. M. Phillips, *Europe Unbound* (ib.); M. A. Ward, *England's Effort* (2nd ed., ib.); H. G. Wells, *Mr. Britling Sees It Through* (ib.); Romain Rolland, *Above the Battle* (Chicago).

**WAR RELIEF ORGANIZATIONS.** See RELIEF FOR WAR VICTIMS.

**WARSHIP LOSSES OF BELLIGERENTS.** See NAVAL PROGRESS.

**WARSHIPS.** See BATTLESHIPS; SUBMARINES.

**WASHINGTON. POPULATION.** The estimated population of the State on December 31, 1916, was 1,565,810. The population in 1910 was 1,141,990.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the

United States Department of Agriculture, in 1915-16 were as follows:

		Acreage	Prod. Bu.	Value
Corn	.....1916	38,000	1,406,000	\$1,406,000
	.....1915	39,000	1,058,000	811,000
Wheat	.....1916	1,590,000	37,685,000	58,818,000
	.....1915	2,000,000	51,420,000	42,160,000
Oats	.....1916	275,000	14,300,000	7,298,000
	.....1915	275,000	18,750,000	5,088,000
Potatoes	.....1916	60,000	9,900,000	9,702,000
	.....1915	61,000	8,285,000	4,865,000
Hay	.....1916	886,000	2,006,000	27,688,000
	.....1915	812,000	1,868,000	20,174,000
Rye	.....1916	7,000	102,000	118,000
	.....1915	8,000	146,000	110,000
Barley	.....1916	165,000	6,814,000	5,724,000
	.....1915	175,000	7,268,000	4,067,000

a Tons.

**MANUFACTURES.** The census for manufactures taken in 1914 and completed in as far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments..	3,674	3,829
Average number of wage earners .....	69,120	67,205
Capital invested .....	\$222,261,000	\$277,715,000
Wages .....	49,766,000	51,708,000
The value of materials used..	117,888,000	136,609,000
The value of products .....	220,746,000	245,326,000

**MINERAL PRODUCTION.** The value of the mined output of gold, silver, lead, copper, and zinc in the State amounted in 1916 to approximately \$2,018,000, compared with \$750,000 in 1915. This is the largest output in the history of the mining of the State. On account of the increase in the prices of the various metals the value of the output was nearly three times that of 1915. The mined production of gold increased from about \$390,000 in 1915 to about \$540,000 in 1916. The silver output increased from 255,837 ounces in 1915 to 315,000 ounces in 1916. Owing to the advance of the average price in silver the value of the output increased from \$129,709 in 1915 to over \$297,000 in 1916. The mined output of copper increased from 1,020,928 pounds in 1915 to about 2,569,000 pounds in 1916. Since the average price was more than \$0.26 a pound in 1916 the value of the copper increased from \$178,662 to over \$701,000. Copper in 1916 was of more importance than gold, which was formerly the principal metal of the State. The mined production of lead increased from 295,215 pounds in 1915 to about 4,937,000 pounds in 1916. The value of the output increased from \$13,875 to about \$336,000. The mined output of zinc increased from 244,906 pounds in 1915 to about 1,709,000 pounds in 1916, an increase of nearly 600 per cent. The value increased from \$33,668 to over \$234,000. The estimated production of coal in the State in 1916 was 2,970,000, an increase compared with 1915 of 541,000 tons or 23 per cent. The increase is due largely to the prosperous condition of lumber and logging companies, manufacturing plants, and railroads and to the increased price of California fuel coal. The supply of labor was sufficient throughout the year and there was no shortage of cars to points in Washington, although cars were not available for shipments to other markets.

**TRANSPORTATION.** The total railway mileage of the State on July 30, 1915, was 8022. This includes mileage of all kinds. Railroads having the longest mileage were the Great Northern, 1196; Oregon and Washington, 992; Chicago, Milwaukee, and St. Paul, 583; and the Northern Pacific, 1955.

**EDUCATION.** The total school population of the State in 1916 was 304,600. The total enrollment was 245,419. The average daily attendance was 191,444. The teachers numbered 9295. See also **UNIVERSITIES AND COLLEGES.**

**FINANCE.** The report of the State Treasurer for the fiscal period 1914-16 shows a balance on Oct. 1, 1914, of \$750,656. The total receipts for the period amounted to \$6,963,403, and the disbursements to \$6,269,548, leaving a balance on hand on Sept. 30, 1916, of \$1,444,510.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include the Western State Hospital at Fort Steilacoom, the Eastern State Hospital at Medical Lake, the Northern State Hospital at Sedro-Woolley, Institute for the Feeble-Minded at Medical Lake, State Soldiers' Home at Orting, Soldiers' Colony at Orting, Washington Veterans' Home at Retisville, State School for the Deaf at Vancouver, State School for the Blind at Vancouver, State Penitentiary at Walla Walla, State Training School at Chehalis, State Reformatory at Monroe, and the State School for Girls at Grand Mount. The number of persons in these institutions in 1916 was 5115, and the expenses for maintenance for the years 1915-16 amounted to \$2,146,298. There were expended for new buildings, repairs, etc., \$1,240,169.

**POLITICS AND GOVERNMENT.** One of the surprises of the presidential campaign was furnished by the State of Washington, where a Republican majority counted upon as certain in the early part of the fight was overturned by the supporters of President Wilson. Not only did Washington give its electoral votes to the Democratic candidate but it elected a Democratic Governor. The Republican candidate for United States Senator was elected by the biggest majority ever given a candidate for that office in Washington, while the entire Republican State ticket below Governor was successful. The returns for President, Senator, and Governor follow: President: Hughes, Rep., 166,399; Wilson, Dem., 182,993; Hanly, Prohibition, 6823; Benson, Soc., 22,544; Reimer, Soc. Labor, 700. United States Senator: Poindexter, Rep., 192,287; Turner, Dem., 135,339; W. J. Thompson, Prog., 1441; J. A. Campbell, Prohibition, 4411; Bruce Rogers, Soc., 21,709. Governor: McBride, Rep., 167,802; Lister, Dem., 181,642; J. E. Bradford, Prog., 2894; A. B. L. Gellerman, Prohibition, 3514; L. E. Katterfield, Soc., 21,117; J. E. Riordan, Soc. Labor, 623. No one reason can account for the facts presented by the election returns, save perhaps that the figures prove that the voters of Washington are generally independent. The success of the supporters of President Wilson was due largely to the activities of a group of Progressive leaders who refused to follow Theodore Roosevelt and to the eloquent appeal of the campaign slogan, "He kept us out of war."

When Charles Evans Hughes was nominated it was generally believed that Washington would give the Republican candidate a majority of at least 50,000, but the people seemed to be dis-

appointed in Mr. Hughes's speeches when he came West. Then, too, the regular Republicans did little to win over the radical Progressives. Many of the Progressives espoused the Wilson cause and the peace talk won thousands of Republican women voters.

The success of United States Senator Miles Poindexter is to be ascribed to his progressive tendencies and to his undoubted ability as a campaigner. In the primary election he was pitted against Representative William E. Humphrey, who had served the State in the lower House for 14 years and who was looked upon as a leader of the regular Republican party. He was beaten in the primary by Poindexter by a plurality of 8000 votes.

It was said that Democrats entered the Republican primary and voted for Poindexter, and he drew votes also from Socialists and the independent voters who affiliate regularly with no party. At the general election the regular Republicans had their choice between Poindexter and former Senator George Turner, a Democrat, and while there was some bitterness felt over Humphrey's defeat, the Republicans generally voted for Poindexter. It is likely that thousands of Democrats expressed their preference for Poindexter at the general election and abandoned their own party candidate.

In the gubernatorial race, the fight was between Henry McBride, Republican, and Gov. Ernest Lister, Democrat. Governor Lister had the advantage of being in office and of being the candidate of the drys. Although Mr. McBride came out squarely for prohibition, the dry element preferred to cast their lot with Lister. Lister's election in the face of a majority for the rest of the Republican ticket was as surprising as the Wilson vote.

Washington's representatives in the lower House consist of four Republicans and one Democrat. This is the exact proportion of party strength indicated two years ago. Representative C. C. Dill, Democrat, was reelected while the Republicans are W. H. La Follette, Albert Johnson, John F. Miller, and Lin H. Hadley.

By a vote of six judges to three the Supreme Court of the State in May decided that a capitol bond issue of \$1,500,000 was unconstitutional. This issue was authorized by the Legislature of 1915 for the purpose of paying back into the general fund moneys borrowed by the Capitol Commission and of completing the Temple of Justice. The Legislature guaranteed interest payments on the bonds by providing a tax levy to tide over until the sale of capitol grant lands should cover this expense and repay to the general fund the amounts paid by direct taxation on the capitol bonds. The court held this to be contrary to the constitutional provision, which restricts the imposition of taxes without authorization by vote of the people.

**STATE OFFICERS.** Governor, Ernest Lister; Lieutenant-Governor, Louis F. Hart; Secretary of State, I. M. Howell; Treasurer, Edward Meath; Auditor, C. W. Clausen; Superintendent of Education, Mrs. Josephine Preston; Attorney-General, W. V. Tanner; Adjutant-General, Maurice Thompson; Commissioner of Agriculture, H. T. Graves; Commissioner of Insurance, H. O. Fishback—all Republicans except Governor, Adjutant-General, and Commissioner of Agriculture, who are Democrats.

**JUDICIARY.** Supreme Court: Chief Justice,

George E. Morris; Associate Justices, Frederick Bausman, O. G. Ellis, M. A. Fullerton, W. Mount, O. R. Holcomb, S. J. Chadwick, Emmett N. Parker, and J. F. Main; Clerk, C. S. Reinhart.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Republicans .....	29	79	108
Democrats .....	6	18	19
Progressives .....	7	5	12
Republican majority..	16	61	77

**WASHINGTON, ALLEN WADSWORTH.** See HAMPTON NORMAL AND AGRICULTURAL INSTITUTE.

**WASHINGTON, BOOKER T.** See LITERATURE, ENGLISH AND AMERICAN, *History, etc.*, American.

**WASHINGTON, UNIVERSITY OF.** A co-educational State institution at Seattle, Wash., founded in 1861. In the fall of 1916 there were 3253 students and in the preceding summer session 1386. For the academic year 1915-16 there were 1059 extension students. The faculty numbered 221. During the year the following benefactions were received: An aëro-dynamic laboratory from W. E. Boeing, of Seattle; an entomological collection from O. B. Johnson, emeritus professor in the university; the Mars fellowship of \$600 per annum, given by the late Dr. Percival Lowell, of Flagstaff Observatory; and a new instructorship in Russian established by Samuel Hill, of Seattle. The university owns property valued at \$5,000,000, which, however, yields an income of only \$55,000, all of this being used for building purposes. From a State millage tax, \$550,000 was derived in 1916. The general library of the university contains 72,000 volumes and receives 500 current magazines. About 6000 volumes a year are being added. The law library contains 10,000 volumes. On March 20 and 21, 1916, took place the inauguration of Dr. Henry Suzzallo, formerly professor of the philosophy of education in Teachers College, Columbia University, as president of the university.

**WASHINGTON AND LEE UNIVERSITY.** A non-sectarian institution for the education of men at Lexington, Va., founded in 1783. In the fall of 1916 the students numbered 520 and the faculty 28. The university had in productive funds \$946,732 and an income of \$113,436. The library contained 50,000 volumes. President, Henry Louis Smith.

**WASHINGTON SQUARE PLAYERS.** See DRAMA.

**WASHINGTON UNIVERSITY.** A non-sectarian co-educational institution in St. Louis, Mo., founded in 1853. In the fall of 1916 the total enrollment of students was 2019, including 646 in Saturday courses for teachers and others, and in evening courses. The faculty numbered 226. In 1916 the university possessed in productive funds \$9,368,277 and had an income of \$618,637. The library contained 161,540 bound volumes and 60,190 pamphlets. In 1916, through gifts from persons and from the General Education Board, \$1,000,000 was available for the Medical School, for departments of medicine and pediatrics. Chancellor, David Franklin Houston (Secretary of Agriculture); acting chancellor, Frederic A. Hall.

**WATER METERS.** See WATER WORKS AND WATER PURIFICATION.

**WATER POWER.** There was little development either in the way of large projects for the utilization of water power or in turbines and regulating machinery in 1916. In the United States the subject bulked large in discussion in Congress and elsewhere, as no grants for water power rights had been conferred since 1912. The conservation interests were able to secure the defeat of various bills in the national legislature and good and bad measures suffered alike. The Ferris bill which passed the House of Representatives failed in the Senate, and the Shields bill from the Senate was rejected by the House. Substitute and other measures were proposed but nothing was accomplished during the year. There were few private enterprises of importance and one reason assigned for this was the increased economy that was being secured by steam plants, which, however, was in large part offset by the ever mounting cost of fuel.

One project, however, was of importance both for its water supply and for its machinery. This was the Yadkin River Development in North Carolina of the Tallahassee Power Co. (See DAMS.) The initial installation included three 31,000 horse power turbines, the largest units ever built of the single-runner Francis type. These machines as well as the entire plant and project were fully described in the *Engineering News* for Nov. 16, 1916, from which the following is abstracted:

The spiral casing for each turbine unit is of circular section and is made of shaped steel plates riveted together and to a cast-steel speed ring delivering the water to the guide vanes and runner.

The casing, of a special patented design, is formed of about two dozen conical sections, each one matching into the other so as to form a continuous smooth passage. The thickness of the plate varies from 3/8 of an inch at the large diameter to 1/16 of an inch at the smallest diameter.

The shaft of the turbine is 24 inches in diameter; that of the generator is about the same. The two shafts are joined by forged flanged couplings between the wheel-guide bearing and generator. The shafts of both waterwheel and generator are hollow, to facilitate inspection of the forging and to permit handling the runner and upper section of the draft tube by means of a cable passing through the centre of the shaft to the hook of the main station crane. The waterwheel and generator are designed as a mechanical unit, so that the lower guide bearing usually furnished with a generator is omitted; the machine, then, is what may be called a "two-guide-bearing unit."

Each of the three units was designed to deliver to the generator shaft not less than 27,000 horse power when operating under an effective head of 165 feet and running at a speed of 154 revolutions per minute. Under these conditions it was to develop an efficiency of not less than 90.5 per cent (efficiency being defined as ratio of water horse power delivered to the unit to mechanical horse power output at the turbine shaft). Each unit also was guaranteed to deliver not less than 31,000 horse power operating under an effective head of 180 feet and at 154 revolutions per minute.

**WATER PURIFICATION.** See **WATER WORKS AND WATER PURIFICATION.**

**WATER RATES.** See **WATER WORKS AND WATER PURIFICATION.**

**WATER WORKS AND WATER PURIFICATION.** Additions to the volume and improvement in the quality of water-supplies, together with general reinforcing of the works and extensions to the distributing mains, proceeded vigorously all over the country. The huge new Catskill supply of hundreds of millions of gallons daily was nearly ready for use and steps were taken to drive a tunnel 18 miles long to add the waters of the Schoharie to those already tributary to the Catskill Aqueduct. (See **AQUEDUCT.**) Preliminary work was under way for a new gravity filtered supply for Providence, R. I. At Cleveland and Milwaukee large and long tunnels were under construction to new lake intakes farther removed from possible contamination. Hundreds of smaller cities were busy with various improvements, including extensions to their meter systems. After several years of committee work, the New England Water-Works Association adopted as a basis for selling water by meters (1) a minimum or readiness-to-serve charge and (2) meter rates of three classes, called domestic, manufacturing, and intermediate. In contrast, St. Louis adopted a sliding scale of meter charges divided into a hundred or more notches, but with a different rate for manufacturers. The latter feature was disapproved by the State Utility Commission. New York and Philadelphia took steps towards extending the use of meters, each city, and notably Philadelphia, being very backward in this respect. New York suffered also from an antiquated schedule of flat water rates for unmetered consumers based on the frontage of building lots. The need for comprehensive water rate revision in New York had been brought home by the fact that when the Catskill supply comes into use the capital charges on the cost would swell the water-works expense account of the city to such an extent as to change the present profits, real or apparent, into an unquestionable deficit.

**WATER PURIFICATION.** Mechanical filtration continues to gain on slow sand filtration, although nearly all the many existing works of the latter type remained in use and were giving good service. The mechanical filters operate at a rate of 100,000,000 gallons or more per acre of filter surface against a rate of 3,000,000 for slow sand filters. This difference was made possible largely by very frequent reverse-flow washing of the sand in the mechanical filters, whereas slow sand filters are generally cleaned by scraping their immense surfaces, washing the sand and replacing it.

At Toronto a 72,000,000-gallon (U. S.) installation of *Drifting Sand Filters*, a modification of the mechanical type, was completed. By means of a constant vertical circulation of water through these filters a considerable part of the sand bed is kept suspended in the water, while some of the sand is constantly being removed, washed in transit, and returned to the top of the filters (see *Engineering News*, Sept. 21, 1916). A 150,000,000-gallon mechanical water filtration and softening plant was completed at Cleveland, Ohio, but could not be put in use owing to settlement defects caused by unstable foundations.

*Alum-Making Plants* to supply the alum or sulphate of alumina commonly used as a coagulant in mechanical filtration, and also used to assist sedimentation before slow sand filtration and where no filtration is employed, were installed during the year at Trenton, N. J., Springfield, Mass., Columbus, Ohio, Omaha, Neb., and at a private company plant that supplies a part of Montreal and vicinity. The Hoover process, an outgrowth of an earlier process used at Columbus, was employed. Bouxite, a natural form of aluminous material, was treated with sulphuric acid and the resulting alum cake or crystallized sulphate of alumina applied to the water to be treated. The bouxite was low priced and no attempt was made to refine the product, as in the manufacture of commercial alum. Considerable saving was effected.

*Water Disinfection* by chlorination became still more common, with liquid chlorine rather than hypochlorite of lime (bleaching powder) as the reagent most generally used. A tiny amount of chlorine is used (less than a grain to a gallon of water). Chlorination is rightly employed as a finishing process after other treatment or as a safeguard pending the installation of filters or before filters are much needed.

**Bibliography.** The chief new publication in this field was A. D. Flinn, R. S. Weston, and C. L. Bogert's *Water-Works Handbook* (New York), a technical reference book. A handsomely illustrated *Final Report on the Construction of the Los Angeles Aqueduct* was published at a moderate price by the city. An unusually complete engineering report on proposed new water works for Sacramento was published by that city.

**WATSON, DAVID THOMPSON.** An American lawyer, died Feb. 24, 1916, at Atlantic City, N. J. Born at Washington, Pa., in 1844, and a graduate at 20 of Washington and Jefferson College, he took his law degree at Harvard in 1866 and two years later established himself in practice in Pittsburgh. In this city he had his home till his death; as senior member of the firm of Watson and Freeman, he was one of the leaders of the local bar. But he gained wider note in government service, as counsel for the United States in the Venezuela and Alaska boundary disputes, and in the "merger" or trust cases, especially the Northern Securities case. Mr. Watson at various times had also been counsel for Senator Matthew S. Quay of Pennsylvania, and for the Standard Oil Company. In 1899 he declined a seat on the bench of the Pennsylvania Supreme Court. The University of Pennsylvania conferred on him the honorary degree of LL.D. in 1905.

**WATSON, JAMES E.** Elected Republican United States Senator from Indiana, Nov. 7, 1916, to fill out the unexpired term (ending 1921) of Senator Shively (q.v.).

**WATTS, MARY S.** See **LITERATURE, ENGLISH AND AMERICAN, Fiction, American.**

**WATTS-DUNTON, THEODORE.** See **LITERATURE, ENGLISH AND AMERICAN, Essays, etc., English.**

**WEATHER.** See **METEOROLOGY; UNITED STATES DEPARTMENT OF AGRICULTURE.**

**WEBSTER, HENRY KITCHELL.** See **LITERATURE, ENGLISH AND AMERICAN, Fiction, American.**

**WEBSTER, JEAN** (Mrs. Glenn Ford McKinney). An American story writer and drama-



tist, died in New York City June 11, 1916. She was born at Fredonia, N. Y., in 1876, and after attending the Lady Jane Grey School at Binghamton, entered Vassar College, from which she graduated in 1901. Later she lived for some years in Italy, and in 1906-07 made a trip around the world. In 1915 she was married to Mr. McKinney, a New York lawyer. She was a grand-niece of Mark Twain. Among her writings were: *When Patty Went to College* (1903); *The Wheat Princess* (1905); *Jerry Junior* (1907); *The Four-Pools Mystery* (1908); *Much Ado about Peter* (1909); and *Just Patty* (1911). But she was best known for *Daddy Long-Legs* (1912), which was dramatized by her in 1914 and produced with success in New York and elsewhere. The next year appeared *Dear Enemy*.

**WEDEKIND, FRANK.** See GERMAN LITERATURE, *Drama*.

**WEIGHTS AND MEASURES.** In 1916 an unusual number of bills affecting weights and measures in the United States were offered in Congress, but few of these were passed. Nevertheless they showed the general interest in the subject, which was further expressed by activity in many States and local districts. A leading event of the year was the examination and test of gasoline measuring apparatus used for the sale of gasoline to motorists. An extraordinary lack of accuracy and also the presence of intentional short selling were found in some investigations made by the United States Bureau of Standards, and the matter also was taken up by many local departments of weights and measures. This was an almost unworked field in most States. The Bureau of Standards published a valuable bulletin, No. 81, on "Liquid Measuring Pumps," that described the various defects of these machines and the necessary tests to be made and precautions to be observed in their use. The tolerances adopted by the Bureau for gasoline measuring pumps were 1 cubic inch in deficiency and 2 cubic inches in excess, in a standard gallon of 231 cubic inches, or approximately 1 and 2 per cent respectively. The great majority of pumps were not operated within these limits especially prior to the various inspection crusades undertaken, but in many places, as in Philadelphia, where a systematic inspection was undertaken, a great improvement was noted. In 1914 in Philadelphia approximately 93 per cent of the measuring pumps were short at least 3¼ per cent. In the following year only 60 per cent were short to 3 per cent, and in 1916 the record was considerably better.

The standard barrel law which was passed by Congress went into effect on July 1st and practically on October 1st. This established the barrel as a unit of capacity, making a standard barrel for the entire United States, so that under the Constitution any State statutes out of harmony with the new law become null and void. This law applied to fruits, vegetables, and other dry commodities, but not to barrels used in packing or shipping articles sold exclusively by weight or numerical count. The act standardized two barrels, one to be used for general commodities and the other for cranberries. There were established in addition to the standard barrel the three-quarter barrel, the half barrel, and the third barrel.

During the year a bill was passed and signed

by the President on August 23rd providing for a national lime barrel. This established a standard lime barrel and other packages for this commodity by weight exclusively. The act further provided for the use of barrels of proper size and the labeling with correct weights. It was to go into effect on Jan. 1, 1917.

With the recent introduction of measures in Congress for the adoption of the metric system of weights and measures in the United States such as the Dillon bill, there was formed late in the year the American Metric Association with Dr. George F. Kunz president and Howard Richards, Jr., of 156 Fifth Avenue, New York City, secretary. This new organization, which was composed of individual, business, and general associations, planned an active propaganda directed in large part among the commercial and manufacturing interests.

**WEIL'S DISEASE.** See JAUNDICE, HEMORRHAGIC; VACCINE THERAPY.

**WELCH, HERBERT.** See METHODIST EPISCOPAL CHURCH.

**WELFARE WORK.** One of the most striking industrial developments of recent years has been the welfare work undertaken by numerous corporations and other employers throughout the United States and in other industrial nations. Welfare work was defined by Miss E. Dorothea Proud, who was connected with the welfare department of the British ministry of munitions, as "voluntary efforts on the part of employers to improve, within the existing industrial system, the conditions of employment in their own factories." (*Welfare Work*, "Employers' Experiments for Improving Welfare Work in Factories," by E. Dorothea Proud, London, 1916.) The term, however, may be more broadly interpreted to include community efforts to better the health and happiness of its members. As undertaken by employers it includes a great variety of efforts to reduce fatigue and increase efficiency, such as the provision of better light, air, and temperature, the permission of rest periods, in the middle of the forenoon and afternoon, the regulation of speed, noise, monotony, and rhythm, reduction in the length of the working day, provision of proper facilities for warm noon-day lunches, the institution of lockers, baths, and related sanitary facilities, the beautifying of factory yards as well as those of employees, the formation of clubs among employees and their children, the furnishing of gardens for the workers and their children, other recreational advantages, the introduction of individual medical attention, including home nursing, and more or less elaborate schemes for compensation in case of sickness, accidents, unemployment, or old age. In the United States every larger employer has within recent years established a welfare bureau for the promotion of safety, health, sanitation, educational work, charity, recreation, savings, loans, civic improvement, and other welfare relationships. The December issue of the *Monthly Review* of the United States Bureau of Labor Statistics published a list of more than 450 employers who had established some form of disability benefit fund.

**PUBLIC HEALTH.** A survey of City Health Departments of 227 cities of the United States having a population of 25,000 or more was completed by Franz Schneider, Jr., of the Russell Sage Foundation. The investigation was begun

in August, 1913, and was conducted by means of letters and questionnaires to the health officers of the various cities. Two hundred and six cities representing 29,000,000 people answered. These showed aggregate total appropriations of \$13,155,547, or roughly, 44.6 cents per capita for public health services. Seattle showed the largest per capita expenditure of 98 cents, while Clinton, Iowa, with  $\frac{3}{4}$  of 1 per cent had the smallest. These subjects were covered in the questionnaire—appropriation, medical inspection of school children, laboratory service, infant hygiene work, health education and publicity, housing regulation, control of venereal diseases, dispensary service, tuberculosis work, industrial hygiene, and the number of privies. Infant hygiene received the most attention in the New England States. The examination of school children was a feature of public health programmes which was generally recognized as important. Briefly summarized, the survey showed that over a fourth of the cities made no effort to educate in health matters; a fifth had no inspection of school children; nearly three-fourths had no housing law; over a third did not offer the laboratory diagnosis for common communicable diseases; over six-sevenths had no programme for venereal diseases; over one-half had poor organizations for combatting infant mortality; less than one-fourth had a systematic programme against tuberculosis; and nineteen-twentieths were unconcerned about industrial hygiene.

A PERMANENT INDUSTRIAL WELFARE EXHIBITION including displays of more than 30 of the largest firms in the United States, each showing phases of welfare work done in its particular line of business, has been established by the Industrial Welfare Bureau of the Detroit Board of Commerce. The following subjects are covered in the exhibition: safety provisions, sanitation, employment, health, recreation, housing, industrial education, insurance, and representation of employees. The purpose of the exhibit is educational, looking toward the social and economic improvement of employees and the advancement of their efficiency.

MISSOURI. The report of the Missouri Children's Code Commission which will be submitted to the Legislature in January, 1917, developed new and radical standards and methods in its recommendations. For administrative purposes, it recommended the creation of a county board of public welfare in each county composed of five members—the school superintendent, judge of the circuit court, and the three judges of the county court. A trained social worker holding a certificate from the State Board of Charities should be employed by this board as superintendent. The report further advocated that the county health officer be placed under the board of public welfare in order that all health and social work of the county be controlled by one directing head. Two new State agencies were recommended. These were an industrial commission to take over work now done by five or six separate departments dealing with industry, and a State board of medical examiners for licensing medical practitioners.

MUNICIPAL RECREATION. In 1911, Los Angeles established a municipal playground camp by means of which her citizens may enjoy an inexpensive vacation. The camp is now located in the San Bernardino Mountains about 76

miles from Los Angeles, and offers ideal conditions for various camping sports. In 1916, 46 cabins were built, and also an open-air dining room, a building with kitchen, storeroom, and cook's headquarters combined, a bath house, two modern toilet buildings, a concrete plunge, a graded athletic field, and a lodge containing an office, reading rooms, and large entertainment hall. More than 1300 people enjoyed vacations in the camp during the summer. Men and boys are conducted in two groups for outings, and women and girls also go in two groups. The entire expense for food, housing, and transportation is \$7.50 for two weeks or \$5.50 for one week, campers being required to furnish their own bedding, towels, etc.

GREAT BRITAIN. A radical departure from established precedents was taken early in 1916 by the establishment of a welfare department in the British ministry of munitions. Its object was to enforce a general responsibility for maintenance of higher standards for the employment of women and girls in munition factories. Mr. B. Seeborn Rowntree, a well-known manufacturer, was appointed director. An act of Parliament August 3rd conferred extensive powers upon the home secretary to secure the welfare of workers in factories and work shops, authority being given to issue mandatory orders regulating arrangements for preparing meals, the supply of drinking water and protective clothing, ambulance and first-aid provisions, the supply and use of seats in workrooms, facilities for washing, accommodation for clothing, and the supervision of workers. These enactments were the result of the growing opinion that not only is welfare work a necessity in the interest of the health and vigor of the working population, but that it is a decided advantage to the employer because it creates a spirit of enthusiastic coöperation on the part of the working force.

WELLAND CANAL. See CANALS.

WELLESLEY COLLEGE. A non-sectarian institution for the education of women at Wellesley, Mass. It was founded in 1875. In all departments in the fall of 1916 there were 1570 students. The faculty numbered 137. During the year Prof. Sarah Frances Whiting, professor of astronomy and director of Whitin Observatory, retired under the Carnegie Endowment, and Dr. John Charles Duncan was appointed to take her place. Important progress was made in the rebuilding necessitated by the disastrous fire of 1914, and in increasing the endowment of the college. From the Rockefeller Foundation \$750,000 was received, from the General Education Board \$200,000, from Andrew Carnegie \$95,000, from an unnamed donor \$415,000 (for a Hall of Residence), and also from unnamed donors two gifts of \$100,000 each. These were all contributions to the Restoration and Endowment Fund. From a former student \$150,000 was received for a new administration building. At the end of the year, Clafin Hall, a new dormitory built in memory of ex-Governor and Mrs. Clafin, was nearly ready for occupancy. This is the third new building to be erected since the burning of College Hall. It will house 100 students. The productive funds of Wellesley College amounted in 1916 to \$2,600,515, yielding an income of \$155,189. Further income, from tuition and other sources, amounted to \$316,280. The library contains

86,722 volumes. President, Ellen Fitz Pendleton. See also UNIVERSITIES AND COLLEGES.

**WELLS, H. G.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction and Essays*, English.

**WESLEYAN METHODIST CONNECTION IN AMERICA.** This denomination, starting in Michigan in 1841 under the name of Wesleyan Methodists, was organized in 1843 at Utica, N. Y., as an anti-slavery and non-episcopal church, and took the name of The Wesleyan Methodist Connection of America. It had at its beginning about 6000 members, and excluded from its membership all persons who were connected with slavery, or with the manufacture or sale of intoxicating drinks, and all who belonged to secret societies. After the close of the Civil War many who had joined the new church, seeing that slavery was abolished, returned to the churches to which they had originally belonged or joined other churches. The denomination emphasizes the Wesleyan doctrines of justification and holiness as essential to salvation. According to the official revised returns of 1915 there are 840 ministers, 675 churches, and 20,669 members. There are foreign missions in Sierra Leone, Africa, and in India. The work of the denomination made considerable progress in 1916, notably along educational lines. A fine new college building was erected at Central, S. C. There are three schools of college grade: at Houghton, N. Y.; Central, S. C.; Miltonvale College, Miltonvale, Kan.; Theological School, Fairmount, Ind. Officers: E. Teter, president of the general conference and missionary secretary; J. S. Willett, agent and treasurer; F. A. Butterfield, editor. The publication house is at Syracuse, N. Y.

**WESLEYAN UNIVERSITY.** A non-sectarian institution for the education of men at Middletown, Conn. It was founded in 1831. In the fall of 1916 the total enrollment of students was 504 and the faculty numbered 55. During the year six additional instructors were appointed. From Mrs. Gardiner Hall, Jr., of South Willington, Conn., \$150,000 was received to construct a new chemical laboratory in memory of her husband. Mr. Ralph H. Ensign of Simsbury, Conn., and his son, Joseph R. Ensign, gave \$30,000 to remodel the university chapel, and a new organ was provided for by a gift of \$10,000 from Mr. John Gribbel of Philadelphia. In 1916 the productive funds of the institution amounted to \$2,457,147, and the income to \$184,917. The library contained 106,000 volumes. During the year the university lost by death its president emeritus, Dr. Bradford P. Raymond (q.v.). President, William Arnold Shanklin. See also ASTRONOMY.

**WESTERN AUSTRALIA.** A state of the Commonwealth of Australia, occupying the western part of the continent west of the Northern Territory and South Australia. It is the largest of the Australian states, the area being 975,920 square miles, which is about 32.8 per cent of the area of the Commonwealth. The population according to the census of 1911 was 282,114 (161,565 males, 120,549 females), exclusive of full-blooded aboriginals. The increase per cent in the decade 1901-11 was 53.22, in 1891-1901 269.86, in 1881-91 67.57. At the end of 1915 the population was estimated at 319,859 (173,309 males, 146,550 females). The capital is Perth, which at the 1911 census had 35,767 inhabitants; including suburbs, 106,792.

The executive authority rests with a governor, who is appointed by the crown and is assisted by a responsible ministry. The Parliament consists of two chambers, the Legislative Council (30 members) and the Legislative Assembly (50 members); members of the Council are elected for six years, and those of the Assembly for the duration of Parliament, which is limited to three years. The franchise was granted to women by an act of 1899. The governor in 1916 (from March, 1915) was Maj.-Gen. Sir Harry Barron, K.C.M.G.; premier, treasurer, and minister for railways, John Scaddan. See AUSTRALIA.

**WESTERN RESERVE UNIVERSITY.** A non-sectarian institution at Cleveland, Ohio. It was founded in 1826 as Adelbert College. The university now comprises this college (for men), a college for women, and professional departments. In the autumn of 1916 there were 2210 students enrolled and the faculty numbered 282. The university received in benefactions \$500,000. There were 120,000 volumes in the library. President, Charles Franklin Thwing.

**WEST POINT.** See UNITED STATES MILITARY ACADEMY.

**WEST VIRGINIA. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 1,399,320. The population in 1910 was 1,221,119.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16 were as follows:

		Acreage	Prod. Bu.	Value
Corn	.....1916	725,000	22,112,000	\$22,388,000
	.....1915	800,000	25,200,000	18,648,000
Wheat	.....1916	320,000	4,640,000	7,424,000
	.....1915	300,000	4,500,000	4,860,000
Oats	.....1916	140,000	3,220,000	2,061,000
	.....1915	120,000	3,480,000	1,775,000
Potatoes	.....1916	48,000	4,224,000	6,674,000
	.....1915	50,000	5,850,000	8,802,000
Hay	.....1916	825,000 <sup>a</sup>	1,270,000	18,415,000
	.....1915	780,000	1,095,000	16,425,000
Tobacco	.....1916	14,100 <sup>b</sup>	12,690,000	1,904,000
	.....1915	11,800	9,881,000	983,000
Rye	.....1916	20,000	320,000	381,000
	.....1915	16,000	224,000	208,000

<sup>a</sup> Tons. <sup>b</sup> Pounds.

**MANUFACTURES.** The census for manufactures, taken in 1914 and completed in as far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments..	2,586	2,749
Average number of wage earners .....	63,898	71,078
Capital invested .....	\$150,922,000	\$175,995,000
Wages .....	88,000,000	48,784,000
The value of materials used.	92,878,000	110,038,000
The value of products .....	161,949,000	198,512,000

**MINERAL PRODUCTION.** The estimated production of the coal of the State amounted in 1916 to 91,000,000 net tons, an increase compared with 1915 of 13,816,000, or nearly 18 per cent. Practically every district in the State shared in the increase. The car supply was adequate in the first half of the year, but was generally

short in the last quarter. There was a shortage of labor in practically all parts of the State.

The year 1915 was a notable one in the coal production in the State. The output was the greatest on record, amounting to 77,184,069 short tons, valued at \$74,561,349, an increase of nearly 8 per cent in quantity and more than 4 per cent in value over the production of 1914. The greatest increases were in the New River and Pocahontas field. During the early part of the year the coal industry in the greater part of the State was depressed, but later revived. There was a shortage of labor, and the number of men employed decreased from 78,963 in 1914 to 75,882 in 1915.

The production of petroleum in the State in 1915 was 9,264,798 barrels compared with 9,680,033 barrels in 1914. The State continued to hold sixth place as an oil producing State.

**TRANSPORTATION.** The railway mileage of the State in 1916 was 3740. The railroads having the longest mileage were the Baltimore and Ohio, 1127; Norfolk and Western, 452; Western Maryland Railroad Company, 198; and the Virginian Railway Company, 119.

**EDUCATION.** The total school population of the State in 1916 was 419,890. The total enrollment was 313,873. The average daily attendance was 223,889. There were 4482 male and 5842 female teachers. The average yearly salary of teachers was \$332.41.

**FINANCE.** The report of the State Treasurer for the fiscal year ending June 30, 1916, shows a deficit on June 30, 1915, of \$226,151. The receipts for the year amounted to \$4,192,696, and the disbursements to \$3,800,484, leaving a balance on June 30, 1916, of \$392,212.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include the Western State Hospital, Spencer State Hospital, Huntington State Hospital, State Tuberculosis Sanatorium, Welch State Hospital, No. 1, McKendree Hospital, No. 2, the Fairmont Hospital, No. 3, the West Virginia Penitentiary, West Virginia Industrial School for Boys, West Virginia Industrial Home for Girls, West Virginia School for the Deaf and Blind, West Virginia Colored Orphans' Home, and the West Virginia Children's Home.

**POLITICS AND GOVERNMENT.** West Virginia in the 1916 election for the first time in two decades chose a Democrat, John C. Cornwell, as its Governor, unseated United States Senator William E. Chilton, a Democrat, and elected as his successor Howard Sutherland, Republican Congressman-at-large. The voters of the "Little Mountain State" sent four Republicans and but two Democrats to Congress. They elected all Republicans for State offices, below that of Governor, and elected a Legislature which is divided against itself. The Senate stands Republican by a majority of 10 and the House has a Democratic majority of 10.

Charles E. Hughes received West Virginia's eight electoral votes, the approximate vote being Hughes 141,432; Wilson, 139,013. Until President Wilson's reelection had been admitted recounts were demanded by the Democratic national committee, throughout the State, but were withdrawn. Likewise Senator Chilton demanded recounts in several counties, but seeing the overwhelming Sutherland majority increasing, withdrew his demands.

In the first Congressional district Congressman M. M. Neely (D.) defeated Thomas W. Fleming (R.) and was reelected. Fleming at first contested, but later withdrew. Both reside in Marion County and Congressman Neely carried every precinct in the county, including his opponent's home precinct. In the second district George Bowers (R.), who succeeded the late Congressman Junior Brown, was reelected by a handsome majority. In the third district Secretary of State Stuart F. Reed (R.) was chosen Congressman. The fourth district reelected Congressman Harry Woodyard; while the fifth and sixth reelected Edward Cooper (R.) and Adam Littlepage (D.), respectively. In its platform the Democratic State committee attacked the personality and administration of the Republican Governor, Henry Drury Hatfield. The Republican convention adopted a platform endorsing Governor Hatfield and the administration. Each party adopted a plank endorsing equal suffrage. The personal unpopularity of the Governor, his arrogant conduct towards the opposition, and various features of the administration were the base of the Democratic campaign, and with this attack they defeated Ira E. Robinson, who retired from the State Supreme Court bench and was made the Republican gubernatorial nominee. Contests in various counties have held up the official certification of the result. These, however, have been withdrawn. Cornwell is elected by a probable majority of 2500 votes.

Houston Young, chief clerk in the office of the Secretary of State, was elected to succeed his chief. William F. Johnson, known as "Pistol Bill," because he framed West Virginia's anti-pistol toting law, was chosen State treasurer. Edward T. England, a member of the State Senate, was elected attorney-general. Judge William N. Miller was reelected to the State Supreme Court and with him was elected Judge Harold Ritz. James H. Stewart was elected State commissioner of agriculture. State Superintendent of Schools Morris P. Shawkey was reelected for the third term.

Failure of the Republican party to elect its gubernatorial candidate was due to factional differences within the party, the outgrowth of the primary, at which Attorney-General A. A. Lilly was defeated for the nomination by Judge Robinson.

Immediately after the election Governor Hatfield called a special session of the Legislature. It was rumored that this session would take away the next Governor's appointive powers, but the proposed bill was never presented. In his call Governor Hatfield pointed out that the special session was of necessity called to block efforts of the Democratic party to have their successful candidate for Governor unseat all Republicans elected to State office. Governor-elect Cornwell denied the existence of such a plot, but the Legislature passed measures taking away any powers which might jeopardize the positions of the officers chosen by the people. It did not, however, take away the Governor's appointive powers. Before adjourning the Legislature amended the State election law, so that in the future no man can vote who has not registered at least two days before the election.

On August 9th a cloudburst near Charleston caused streams to overflow in Cabin Creek Valley, destroying many villages in the mining dis-

trict, and property damage amounting to \$2,000,000 and a loss of more than 50 lives.

**STATE OFFICERS.** Governor, John J. Cornwell; Secretary of State, Houston Goff Young; Superintendent of Education, M. P. Shawkey; Auditor, John S. Darst; Commissioner of Agriculture, James H. Stewart; Attorney-General, E. T. England; Treasurer, William S. Johnson; Adjutant-General, John C. Bond; Commissioner of Insurance, J. S. Darst, ex-officio—all Republicans, except Governor, Democrat.

**JUDICIARY.** Supreme Court of Appeals: President, L. Judson Williams; Associate Judges, George Poffenbarger, William N. Miller, Charles W. Lynch, Harold A. Ritz; Clerk, W. B. Matthews.

STATE LEGISLATURE:

	<i>Senats</i>	<i>House</i>	<i>Joint Ballot</i>
Republicans .....	20	42	62
Democrats .....	10	52	62
Majority .....	10R	10D	—

**WEST VIRGINIA UNIVERSITY.** A co-educational State institution at Morgantown, W. Va. It was founded in 1867. The total enrollment in the fall of 1916 was 1096. There were 108 members in the faculty. The productive funds of the institution amounted to \$115,104. From all sources an income of \$546,914 was obtained. There were 45,000 volumes in the library. Acting president, Frank Butler Trotter.

**WHARTON, EDITH.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, American.

**WHEAT.** The world's wheat production in 1916 was much below the record yield of the preceding year. The crop in the northern hemisphere as estimated by the International Institute of Agriculture, Rome, was 3,221,181,000 bushels or only about 80 per cent of the production of 1915, decidedly inferior to that of the four preceding years, and even 5.1 per cent under the average of the five years 1909-13. The above estimate is based to the extent of 69.1 per cent on data actually furnished and of 30.9 per cent on the average of the five years preceding the European war, taken as the yield in 1916, for countries not giving out crop information at this time. A number of countries for which no recent data are available, including China, Greece, Mexico, Persia, Portugal, Serbia, and Turkey in Europe and in Asia, whose aggregate yield is roughly estimated at about 245,000,000 bushels, are not considered in this connection. The harvest of the southern hemisphere, of 1915-16 amounted to 353,652,210 bushels, which was a record yield, but the crop of 1916-17, notably in Argentina, suffered considerable injury from drouth and the depredations of locusts. The requirements of the northern hemisphere for the commercial season, Aug. 1, 1916, to July 31, 1917, are placed at 3,679,321,800 bushels and the available supply, including 509,197,820 bushels left over from the preceding crop in the northern hemisphere and 97,248,410 bushels in the southern hemisphere, is estimated at 3,827,627,000 bushels, leaving a surplus of almost 158,000,000 bushels. The quantity used in both hemispheres for seed, based on data for the five years 1909-10 to 1913-14 and included in the above requirements, is given as 412,188,710 bushels. Owing to war conditions ocean freight rates reached a high figure during the

year and also fluctuated to a considerable extent. In February, 1916, the rates per bushel to Liverpool from New York were 47.9 cents, from Portland 50.6 cents, and from Buenos Aires 89 cents, as compared with 3.8, 21.1, and 5.2 cents respectively in February, 1914. The average price of wheat in New York for the six months April to September, 1916, was \$1.419 and in Liverpool \$1.773.

The total wheat production of the United States in 1916 as estimated by the Department of Agriculture was 639,886,000 bushels, produced on 52,785,000 acres at the rate of 12.1 bushels per acre. As compared with 1915 the production was smaller by 385,915,000 bushels, the acreage by 7,684,000 acres, and the average yield per acre by 4.9 bushels. The average farm value on Dec. 1, 1916, was \$1.603 per bushel, and the value of the total crop on this basis \$1,025,765,000. The price level was the highest since the close of the Civil War, and the total value of the crop the highest ever recorded, even exceeding that of the record production of 1915 by \$83,462,000. The leading States and their yields were as follows: Kansas, 98,022,000, Nebraska 68,550,000, North Dakota 39,325,000, Washington 37,635,000, Oklahoma 29,585,000, Montana 28,655,000, Minnesota 27,555,000, and Pennsylvania 26,125,000 bushels. Kansas ranked first in acreage with 8,174,000 acres and North Dakota second with 7,150,000. The winter wheat production of the country amounted to 481,744,000 bushels on 34,829,000 acres, the average acre yield being 13.8 bushels. The corresponding figures for 1915 were 673,947,000 bushels, 41,308,000 acres, and 16.3 bushels respectively. The leading winter wheat States and their production were as follows: Kansas 97,500,000, Nebraska 64,800,000, Oklahoma 29,585,000, Pennsylvania 26,125,000, and Ohio 20,250,000 bushels. The spring wheat production was only 158,142,000 bushels on 17,956,000 acres, at the very low rate of 8.8 bushels per acre, due to weather conditions and attacks of black rust in the three principal spring wheat States. In 1915 the production was larger by 193,712,000 bushels, the acreage by 1,205,000 acres, and the yield per acre by 9.6 bushels. The leading States and their yields were as follows: North Dakota 39,325,000, Minnesota 26,645,000, South Dakota 22,050,000, and Washington 19,350,000 bushels. The annual production of durum wheat is estimated at about 50,000,000 bushels, which is produced mainly in the Dakotas. The farm value of durum wheat was about 7 cents per bushel less than that of other spring wheats, but the yield was enough larger to make the value per acre higher than that of the other class. The wheat production of the United States in 1916 gave a per capita supply of 6 bushels as compared with 10 bushels in 1915, 9 in 1914, nearly 8 in 1913, and 7.65 bushels in 1912. Allowing for the wheat exported and carried over to the following year the actual per capita consumption was 6.55 bushels in 1915, 5.89 in 1914, and between 6 and 6.50 bushels in the preceding 10 years. A large surplus carried over from 1915 helps to meet the 1916 deficiency. The wheat crop of Canada was about 30 per cent below the normal production as the result of frost and rust.

**WHEELER, EVERETT P.** See LITERATURE, ENGLISH AND AMERICAN, *History, etc.*, American.

**WHIPPLE, LEANDER EDMUND.** An American editor and author, died at Greenwich, Conn., May 25, 1916. He was born in 1843. He early became interested in mental healing, and in 1895 founded the *Metaphysical Magazine*, which he edited for 21 years. He taught a system of metaphysics by correspondence. His publications include: *Absent Treatment in Metaphysical Healing* (1891); *The Philosophy of Mental Healing* (1896); *Universal Intelligence* (1896); *Mental Healing* (1905); *A Manual of Mental Science* (1911); *True and False Conceptions of Mental Science* (1911); *Practical Health* (1914).

**WHISKEY.** See LIQUORS.

**WHITE, HORACE.** An American editor and financial expert, died in New York City, Sept. 16, 1916. He was born in Colebrook, N. H., in 1834, but spent his boyhood and youth at Beloit, Wis. After graduating from Beloit College in 1853, he was successively city editor of the *Chicago Evening Journal*, correspondent of the Associated Press, and assistant secretary of the National Kansas Committee. For the *Chicago Tribune* he accompanied Abraham Lincoln on his campaign against Stephen A. Douglas in 1858 (for his impressions consult Herndon and Weik's *Life of Lincoln*). During the presidential campaign Mr. White held the chairmanship of the Illinois State Republican Committee and in 1861 he went to Washington for the *Tribune*. In 1864, with Henry Villard and Adams S. Hill, he formed a syndicate of papers to receive news from the war front, himself directing the Washington bureau of this service. From 1865 to 1874 he was editor-in-chief of the *Chicago Tribune* and afterward for several years was treasurer of the Oregon Railway and Navigation Company, with headquarters in New York. When Henry Villard founded the *New York Evening Post* in 1881 he was joined by Carl Schurz, Edwin L. Godkin, and Horace White, who, after about a year became head of the company. From 1899 to 1903 he was Godkin's successor as editor-in-chief, retiring as editor emeritus. Mr. White combatted vigorously and effectively the greenback and free silver movements. He wrote a standard text-book on *Money and Banking* (1895; 5th ed., 1914) and a *Life of Lyman Trumbull* (1913), translated from the Greek Appian's *Roman History*, and edited French and Italian works on finance. In 1908 Governor Hughes appointed him chairman of the Wall Street Investigating Commission. Consult the *New York Evening Post*, Sept. 18 and 21, 1916.

**WHITE, J(AMES) WILLIAM.** An American surgeon, died in Philadelphia April 24, 1916. He was born in Philadelphia in 1850, and took the degrees of M.D. and Ph.D. at the University of Pennsylvania when only 21. During the two following years he accompanied Prof. Louis Agassiz on the Hassler Expedition around South America, returning to practice medicine in his native city. Dr. White was long connected with the University of Pennsylvania, successively holding several chairs, and retiring finally as John Rhea Barton professor of surgery. He retained an emeritus professorship and the office of trustee of the university. In addition he was surgeon to several Philadelphia hospitals, and to the Pennsylvania Railroad, and for a decade surgeon of the First Troop of Philadelphia City Cavalry. Greatly interested in intercollegiate

athletics, he served his alma mater as its first professor of physical education and as president of the Athletic Association. In 1915 he visited France, where he was identified with the American Ambulance Hospital at Neuilly. Dr. White published, with other eminent surgeons, medical works of high importance. In 1906 the University of Aberdeen honored him with the degree of LL.D. The bulk of his estate, about \$400,000, was left to the University of Pennsylvania; of this, \$150,000 was to be used to establish the J. William White chair of surgical research.

**WHITE, JOHN BARBER.** See SHIPPING BOARD, UNITED STATES.

**WHITE, J. CAMPBELL.** An American clergyman and educator, installed as president of the College of Wooster (Ohio), Oct. 12, 1916.

**WHITE, STEWART EDWARD.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, American.

**WHITE, WILLIAM ALLEN.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, American.

**WHITE SLAVERY.** See PROSTITUTION.

**WHITMAN, CHARLES S.** Re-elected Republican Governor of New York, Nov. 7, 1916. See NEW YORK.

**WHITNEY, WILLIS R.** See CHEMISTRY, INDUSTRIAL, *Medals*.

**WHITTEMORE, DON JUAN.** An American railway engineer, died at Milwaukee, Wis., July 17, 1916. He was born at Milton, Vt., in 1830, and received his education at Bakersfield Academy. At 17 he became an engineer on the Vermont Central Railroad, and thereafter he was connected with various roads, but principally with the Chicago, Milwaukee, and St. Paul, until his retirement as its consulting engineer in 1910. He had then been chief engineer of this road since 1863. The University of Vermont and the University of Wisconsin gave him honorary degrees, and in 1884-85 he served as president of the American Society of Civil Engineers.

**WIDOWS' PENSIONS.** See PENSIONS FOR MOTHERS.

**WIDTSON, JOHN ANDREAS.** An American educator, chosen in 1916 president of the University of Utah. Since 1907 he had been president of the Agricultural College of Utah.

**WILBERFORCE, (ALBERT) BASIL (ORME).** An Anglican clergyman, died in London May 13, 1916. The son of Samuel Wilberforce, who was Bishop of Oxford and later of Winchester, he was born in 1841 in Winchester, his father being then canon. Basil Wilberforce studied at Eton and at Exeter College, Oxford, where he received the degree of D.D. In 1868 he became chaplain to his father, at Oxford, then he held several curacies, was rector of St. Mary's, Southampton, and from 1894 to 1900 served as canon of Westminster, being also rector of St. John's, and, from 1896, chaplain of the House of Commons. In 1900 he received the appointment of Archdeacon of Westminster. Archdeacon Wilberforce gained a remarkable reputation as a preacher. He was the author of various religious works, several volumes being collections of sermons preached in Westminster Abbey. These are entitled: *Sermons Preached in Westminster Abbey* (1898); *Feeling After Him* (1902); and *Sanctification by the Truth* (1906).

**WILBUB, RAY LYMAN.** An American educator, installed Jan. 22, 1916, as president of Leland Stanford Junior University, succeeding Dr. John Casper Branner, who retired as president

emeritus. Dr. Wilbur had been since 1909 professor of medicine in the university and since 1911 dean of the Medical School. In 1912-13 he served as president of the American Academy of Medicine.

**WILDENBUCH, ERNST VON.** See GERMAN LITERATURE, *New Editions*.

**WILLARD GIBBS MEDAL.** See CHEMISTRY, INDUSTRIAL, *Medals*.

**WILCOX, WILLIAM RUSSELL.** See UNITED STATES, *Presidential Campaign*.

**WILLIAM II.** See UNITED STATES AND THE WAR; WAR OF THE NATIONS.

**WILLIAM, CROWN PRINCE.** See WAR OF THE NATIONS.

**WILLIAMS, JOHN SHARP.** Relected Democratic United States Senator from Mississippi, Nov. 7, 1916.

**WILLIAMS COLLEGE.** A non-sectarian institution for the education of men at Williamstown, Mass. It was founded in 1793. In the fall of 1916 there were 5522 students, all but three of whom were undergraduates. The faculty numbered 54. During the year Dr. Samuel Fessenden Clarke, professor of natural history, retired. For the endowment of the college \$389,775 was received. The total productive funds amounted to \$2,152,249 at the close of the fiscal year ending March 31, 1916, and the income was \$87,352. In the library were 86,000 volumes. President, Harry Augustus Garfield.

**WILSON, SIR CHARLES RIVERS.** A British financier, public official, and railroad president, died in London Feb. 9, 1916. He was born in 1831 in London and was educated at Eton and at Balliol College, Oxford, from which he graduated in 1853. Entering the Treasury three years later, he rose to be Controller-general of the National Debt Office, a post which he held for 20 years, from 1874 to 1894. For long he was identified with British interests in Egypt, first as joint Finance Minister of the country, during 1877-79, when both France and Britain were represented there and much difficulty arose from the schemes of Ismail Pasha. Even earlier, in 1876, Mr. Wilson had become a member of the Council of the Suez Canal Company, and in this interest he remained in touch with Egyptian conditions until 1895; he was credited with having done much to conciliate French shareholders and others identified with the Canal, who had become dissatisfied. The C.B. had been bestowed on Mr. Wilson in 1876, and in 1895 he received the G.C.M.G. In the latter year he assumed the presidency of the Grand Trunk Railway of Canada; but he made his home in London.

**WILSON, HARRY LEON.** See LITERATURE, ENGLISH AND AMERICAN, *Fiction*, American.

**WILSON, WOODROW.** See UNITED STATES, *passim*, especially *Presidential Campaign*; UNITED STATES AND THE WAR; also see LITERATURE, ENGLISH AND AMERICAN, *Essays and History*, etc., American.

**WINDWARD ISLANDS.** A collection of separately administered British colonies in the West Indies. See GRENADA, ST. LUCIA, and ST. VINCENT.

**WINES.** See LIQUORS.

**WINNIPEG AQUEDUCT.** See AQUEDUCT.

**WINTER, WILLIAM.** See LITERATURE, ENGLISH AND AMERICAN, *Essays*, American.

**WIRELESS TELEGRAPHY AND TELEPHONY.** The year was marked by improvement in the details of apparatus for radio sig-

naling, especially of those varieties of vacuum bulb devices of the audion type, for which many patents were applied for and granted. Most of these inventions were improvements upon those that had already shown their value, rather than actually new things, involving a new principle. It is hardly necessary to mention the fact that wireless telegraphy continued to demonstrate its indispensability for signaling between ships at sea, and between ships and shore stations.

There was a considerable increase in the number of radio stations in the United States, which were, as is generally known, under the control of the United States Bureau of Navigation. This bureau reported that, as of July 1, 1916, there were 452 land stations, 920 ship stations, and 5255 amateur licensed stations; the last class showing the greatest increase over the preceding year. As formerly, also, the United States government had charge of the radio stations at Sayville, N. Y., and Tuckerton, N. J., and thereby controlled absolutely the transmission to and publication of messages from Germany. Earnings of the various companies operating wireless stations were somewhat greater than had been reported for the previous year, but these companies were not as yet considered to be on a profitable commercial basis.

The United States Bureau of Standards was working on the development of radio devices for fog signals and for locating the positions of ships, and it was expected that the bureau would be able to offer valuable suggestions for the construction of apparatus of this kind at an early date. The army radio sets that had been developed for field service were in constant and satisfactory use in the maneuvers that involved the movement of troops into Mexico. As mentioned in the 1915 YEAR BOOK, radio-telegraphic service had been established between the United States and Japan through the relay station at Kahuku, Hawaii, during that year, and improvements in the transmitting and receiving apparatus made it possible during 1916 to signal directly from San Francisco to Funabashi, near Tokyo, Japan, without relaying, when atmospheric conditions permitted. Three new stations for communication across the Pacific were built by the United States government during the year (at San Diego, Cal., Pearl Harbor, Hawaii, and Cavite in the Philippines); and it was expected that regular commercial service would be inaugurated early in 1917. The large installation that had been built near New Brunswick, N. J., for communication with Carnarvon, Wales, and which had been closed since the beginning of the war, was still unused during 1916, and it was highly improbable that any attempt would be made to employ it until after the cessation of hostilities. Furthermore, in connection with transatlantic service, it was reported that a generating set of much larger capacity than any before used was under construction in Germany for service between Nauen and Sayville, the capacity of the set being reported to be 5000 kilowatts. While there were no marked achievements in long distance radio-telephony, yet it was well known that the stations that had installed apparatus of this kind were communicating more successfully than ever before, over distances of from 50 to 75 miles. While many of the commercial details of the problem had not been worked out, much was expected from

several devices that were under test at the close of the year.

Dr. Lee De Forest, at his experimental laboratory at High Bridge, N. Y., inaugurated an interesting experiment by transmitting the sounds produced by a Columbia graphophone to various radio stations within a distance of 20 miles that were equipped with radio-telephonic receivers of a sufficiently sensitive type to respond in a dependable manner. The type of transmitting apparatus used was an "oscillating audion," connected with a telephonic transmitter placed inside the cabinet of the graphophone. At receiving stations, apparatus capable of responding to either damped or undamped radiations was installed, and sensitive over a range of wave-length of from 200 to 2500 meters. It was reported that the graphophone records were distinctly audible at all stations properly equipped within the 20-mile zone. Not only were musical and other records thus sent out, but for some time a news service was maintained giving a digest of all important daily events.

Atmospheric interference, that well-known source of interference with radio communication, was still one of the difficulties that had not been overcome, although many new devices were brought out for the purpose of solving this important problem. It was considered, however, that nothing of an important nature had been accomplished in this direction. With more substantial apparatus at the sending and receiving stations, however, the service in general had become more dependable, and it was the confident expectation of radio engineers that the atmospheric trouble would soon be largely overcome.

At the close of the year, considerable difference of opinion existed regarding the expediency of government ownership of all radio stations and services. The necessity and desirability of such a thing in a state of war were maintained by one party to the controversy, while another group of people contested this idea on the ground that all important inventions and developments in radio transmission had come through private enterprise and individual, not governmental, initiative. It seemed likely, however, that in view of the prevailing national scheme of preparedness, some form of Federal ownership, amounting to more than mere control, would prevail.

**WISCONSIN. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 2,513,758. The population in 1910 was 2,333,860.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16, were as follows:

	Acreage	Prod. Bu.	Value
Corn .....	1,690,000	60,840,000	\$55,978,000
1915	1,775,000	40,825,000	27,761,000
Wheat .....	188,000	3,315,000	5,304,000
1915	205,000	4,662,000	4,429,000
Oats .....	2,200,000	81,400,000	41,514,000
1915	2,100,000	97,650,000	85,154,000
Potatoes ...	290,000	13,630,000	20,036,000
1915	298,000	25,926,000	11,667,000
Hay .....	2,600,000	4,420,000	51,272,000
1915	2,576,000	4,508,000	44,629,000
Rye .....	375,000	6,075,000	8,019,000
1915	420,000	7,770,000	6,760,000
Barley .....	610,000	18,300,000	19,215,000
1915	540,000	19,170,000	10,785,000

• Tons.

**MANUFACTURES.** The census for manufactures, taken in 1914 and completed in so far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments...	9,721	9,104
Average number of wage earners .....	182,588	194,310
Capital invested .....	\$605,657,000	\$754,287,000
Wages .....	93,905,000	112,193,000
The value of materials used .	346,356,000	417,416,000
The value of products.....	590,305,000	695,173,000

**MINERAL PRODUCTION.** Wisconsin ranks fourth among the States in the production of iron ore, being surpassed only by Minnesota, Michigan, and Alabama. The total production in 1915 was 1,095,388 gross tons, compared with 886,512 gross tons in 1914. There were shipped from the mines of the State in 1915 1,125,269 gross tons valued at \$2,188,012, compared with 591,595 tons, valued at \$1,178,610 in 1914, an increase of 90 per cent in quantity and 86 per cent in value.

The value of the mined output of lead and zinc in 1915 was \$10,486,212, compared with \$3,291,437 in 1914. The total metal content of the lead produced was 2322 short tons, valued at \$218,268, and of zinc 41,403 short tons valued at \$10,267,944.

**TRANSPORTATION.** The total railway mileage of the State in 1916 was 7592. The roads having the longest mileage are the Chicago and North Western 2168, Chicago, Milwaukee, and St. Paul 1796, Minneapolis, St. Paul, and Sault Ste. Marie 1352.

**EDUCATION.** The school population of the State in 1916 was 801,456. The enrollment was 458,102. The average daily attendance was 371,494. The number of teachers was 16,268. The expenditure for city schools was \$3,700,000; for rural schools, \$4,240,000; for graded schools, \$2,170,000; for village schools, \$2,970,000; for the University of Wisconsin, \$2,500,000; for normal schools, \$1,115,000; for continuation schools, \$733,000. The total expenditures were \$22,718,000.

**FINANCE.** The report of the State Treasurer for the fiscal year 1916 shows a balance on June 30, 1915, of \$3,943,597. The receipts for the year amounted to \$19,358,895, and the disbursements to \$19,604,213, leaving a balance on June 30, 1916, of \$3,698,278.

**CHARITIES AND CORRECTIONS.** The charitable, penal, and correctional institutions of the State include the following (the populations are given for the year ending Nov. 30, 1916): State Hospital for the Insane, at Mendota, 624; Northern Hospital for the Insane, at Winnebago, 622; School for the Blind at Janesville, 129; Industrial School for Boys, at Waukesha, 399; Wisconsin State Prison, at Waupun, 935; State Public School, at Sparta, 174; Home for Feeble-Minded at Chipewaw Falls, 1126; State Reformatory, at Green Bay, 284; State Tuberculosis Sanatorium, at Wales, 190; Hospital for Criminal Insane, at Waupun, 103; Tomahawk Lake Camp, at Tomahawk Lake, 20; Milwaukee Hospital for the Insane, at Wauwatosa, 473; and county asylums for the chronic insane, 6112. The total population of all these institutions was 11,379.



The State institutions are managed by a board known as the "State Board of Control of Wisconsin," which has complete supervision over all institutions and is also clothed with power to parole inmates of the State Prison, State Reformatory, Industrial School for Boys, and the Milwaukee County House of Correction. The board has charge also of State probation matters and all persons convicted of felonies are placed on probation by the courts of the State or put under the supervision of the State Board of Control.

The Legislature has established two new institutions, the Industrial Home for Women, in Fond du Lac County, and the Southern Home for Feeble-Minded and Epileptic, in Racine County, and contracts for the buildings for those institutions have already been made.

The Legislature has enacted a law providing aid to dependent children of worthy mothers. The State reimburses the counties in an amount equal to one-third of the amount expended by each county and the State Board of Control passes upon the cases that are entitled to State aid. The law does not provide for aid to children of divorced women.

The total expenditure for the maintenance and operation of State institutions for the fiscal year ending June 30, 1916, was \$1,191,336.71.

There are 35 county asylums for the chronic insane in the State and these institutions have a population of about 6150. Each county asylum has a large farm connected with it which furnishes employment for those patients who are in a proper physical condition to perform any labor.

The State has made provision for the care of dependent crippled and deformed children and the average population of the department for the care of that class is about 40.

The State has also made provision for the segregation of chronic tubercular insane persons and these patients are cared for in an institution that is separated from any county asylum. Ten counties of the State have established county sanatoria for the care of tubercular patients in the advanced stages and a number of other counties have already made provision for the establishment of such institutions.

**POLITICS AND GOVERNMENT.** There was no meeting of the Legislature in 1916. Elections were held for Governor and United States Senator, and the chief interest of the campaign centred about these elections. Senator La Follette was a candidate for reelection to the Senate. For Governor Emanuel L. Philipp was renominated by the Republicans. In the election of November 7th Senator La Follette was reelected by a vote of 251,303, compared with 135,144 for Wolfe, his Democratic opponent. Governor Philipp was elected by a vote of 229,889 compared with 164,555 for Williams, his Democratic opponent. For President, Hughes received 221,323 votes, compared with 193,042 for President Wilson. All the State officers elected were Republicans. A presidential primary election was held on April 4th, in which Senator La Follette received a majority of the votes for a candidate at the national convention.

The United States Supreme Court in June declared that the Wisconsin law revoking the charters of foreign corporations which removed cases from the State courts to those of the United States is unconstitutional. The cases in

point involved the Philadelphia and Reading Coal and Iron Company and the Western Union Telegraph Company.

**STATE OFFICERS.** Governor, Emanuel L. Philipp, Republican; Lieutenant-Governor, Edward F. Dittmar, Republican; Secretary of State and Auditor, Merlin Hull, Republican; Treasurer, Henry Johnson, Republican; Adjutant-General, Orlando Holway; Attorney-General, Walter S. Owen, Republican; Superintendent of Education, C. P. Cary; Commissioner of Agriculture, C. P. Norgord; Commissioner of Insurance, M. J. Cleary, Republican.

**JUDICIARY.** Supreme Court: Chief Justice, John B. Winslow; Associate Justices, Roujet D. Marshall, Robert G. Siebecker, James C. Kerwin, Aad John Vinje, Marvin B. Rosenberry, Franz C. Eschweiler; Clerk, Arthur A. McLeod.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Republicans .....	24	79	103
Democrats .....	6	14	20
Socialists .....	3	7	10
Republican majority..	15	58	78

**WISCONSIN, UNIVERSITY OF.** A co-educational State institution at Madison, Wis. It was founded in 1848. The total enrollment of students in all departments in the fall of 1916 was 5020, and the faculty, including assistants, numbered 726. The more important resignations from the faculty were as follows: T. S. Adams, professor of political economy; H. W. Ballentine, professor of law; E. Blackwelder, professor of geology; G. W. Ehler, director of physical education; E. C. Elliott, director of the teachers' training course; and R. S. Butler, associate professor of political economy. Among new appointments were: W. H. Page, professor of law; D. S. Hill, acting professor of education; W. H. Twenhofel, associate professor of geology; and J. C. Gaylord, acting associate professor of public speaking. During the year the four-year course in music was revised and the degree of Bachelor of Music substituted for that of Graduate in Music. In the College of Letters and Science a new course without foreign language requirements leading to the degree of Bachelor of Philosophy was established. A new \$190,000 physics building to house the department of physics, the course in commerce, and the department of political economy was erected. The productive funds of the institution amounted to \$685,627. The receipts for 1915-16, not including \$11,022 from trust-funds, amounted to \$2,765,330. The library contained 240,000 volumes. President, Charles Richard Van Hise. See also UNIVERSITIES AND COLLEGES.

**WOLCOTT, JOSIAH OLIVER.** Elected Democratic United States Senator from Delaware. Nov. 7, 1916.

**WOLF, HENRY.** An American wood engraver, died March 18, 1916, in New York City. He was born in 1852 at Eckwersheim, Alsace, and studied under Jacques Lévy, a noted engraver of Strassburg. Coming to the United States in 1871, he soon gained a reputation, and at the time of his death he was recognized as one of the two greatest contemporary masters of his art in the country, the other being Timothy Cole. Mr. Wolf exhibited abroad as well as in

the United States, receiving awards at the Paris Salon and the Paris Expositions of 1889 and 1900, at Chicago (1893), Rouen (1903), at St. Louis (1904), where he received a diploma and grand medal of honor for his services to engraving, and at San Francisco (1915), where he was awarded a grand prize. He was also a member of the juries of admission and awards at several expositions. The National Academy of Design elected him an associate in 1905 and a member in 1908; and he became identified with various other artistic societies, American and foreign. Several noted series of engravings by Mr. Wolf, such as "American Artists" and "Portraits of Ladies," appeared in *Harper's Magazine* and the *Century*. He executed portraits after Whistler, Gilbert Stuart, and other famous painters, and produced a number of original landscape engravings, including: "The Morning Star"; "The Evening Star"; "A Duck Pond"; "Lower New York in a Mist"; "Evening, Swan Lake, Central Park."

**WOLFFRAM, CHARLES B.** A German-American newspaper owner and editor, died in New York City April 3, 1916. He was born in Pomerania, Germany, in 1848, but when 19 came to the United States and since then had been identified with German newspapers in this country. After two years as editor of the *Virginia Staats-Zeitung*, he removed to New York in 1871, and gaining an interest in the *New Yorker Journal* brought this paper to success. Finally it was merged with another sheet as the *New Yorker Zeitung*. Mr. Wolfram, in 1880, during the Garfield campaign, founded the first German afternoon paper in the city, the *New Yorker Herold*. This he sold for one cent, as against the customary two cents, and it proved to be a great success. To house it Mr. Wolfram built a large plant near Park Row. Although offered several posts by Republican Presidents, he accepted none except the appointment made by President Taft of commissioner for the presentation of a statue of Baron Steuben to the people of Berlin.

**WOMAN MOVEMENT. UNITED STATES.** As in 1915, so in 1916, the continuance of the war in Europe left its impression on the activities and endeavors of women the world over. The United States was no exception to this rule. Women in this country devoted their energies to the charitable work connected with the war and to the continuance and strengthening of the pacifist movement, which sought not merely to keep the United States out of the war but to establish a connecting link between American women, the women of other neutral nations, and the women of the belligerent countries. One of the most remarkable manifestations of this movement was the Woman's Peace Convention, held at the beginning of December at Washington under the leadership of Miss Jane Addams and other prominent women. Topics discussed included a proposal for a commission representing Japan, China, and the United States to study the complex questions at issue between the Far East and this government, the establishment of Federal control over aliens, and the calling of a third Hague conference at the earliest possible moment. Earlier in the year Miss Addams, who was a member of the Ford Peace Party, visited the European capitals and interviewed government officials. Less conspicuous but yet rather widespread were the activities of other women

favorable to preparedness. Mrs. Gertrude Ather-ton and leading society women were prominent advocates of military measures; several thousand women took part in the mammoth preparedness parade in New York City, May 13th; a women's patriotic parade was held at Newport July 4th; drilling of women was begun in New York armories in the spring; rifle clubs were formed here and there; and military, aviation, and wireless instruction was given women and girls at Huguonot Park, Staten Island, at the Interstate Military Camp, Birchwood Lake, N. Y., and at Rowayton-on-the-Sound, Conn.

The woman movement in America also took advantage of the fact that this country was at peace. Movements intended to raise the status of women as well as the standard of life, such as the birth-control propaganda, were therefore able to attract extensive public attention. (See NATIONAL BIRTH CONTROL LEAGUE.) Likewise, the resolutions passed at the thirteenth biennial convention of the General Federation of Women's Clubs showed the wide scope of the activities of American women. These resolutions advocated a woman's division in the Federal Bureau of Labor, a rigid censorship of moving pictures, a pension system for civil service employees, the teaching of domestic science in the schools, the endorsement of the Federal child labor bill. Three measures especially favored by Mrs. Pennybacker, retiring president of the Federation, were also carried, that a conference of the three Americas be called in 1920, that the Federation cooperate in every way to Americanize the immigrant, and to improve rural life.

The most remarkable achievements of women in new fields of activity were the election of Miss Jeannette Rankin (q.v.) to Congress as a member-at-large for Montana and the record-breaking aeroplane flight of Miss Ruth Law from Chicago to New York (see AERONAUTICS). Among other instances may be mentioned the promotion of Dr. Katharine Davis, the first woman Commissioner of Correction to the chairmanship of the new Parole Board in New York City and the appointment of five women inspectors to the Department of Street Cleaning. On March 6th the trustees of Columbia University voted for the admission of women to the medical school, an innovation which had been violently opposed in former years. See also UNIVERSITIES AND COLLEGES.

The "feminization of industries" and the growing economic influence of woman, phenomena stimulated by the war in Europe to abnormal proportions, manifest themselves also in the United States more clearly every year. The problems of the woman worker were discussed at a conference of Southern women held in New Orleans, in April, to consider the industries peculiarly suited to girls and women. A nation-wide movement for an eight-hour day for women workers was started in December by the first Middle-Atlantic Eight-Hour Conference of the National Women's Trade Union League, held in New York. See WOMEN IN INDUSTRY.

**EUROPE.** In Europe, mainly of course in the belligerent countries, the increase in the employment of women was striking. The Women's Labor League initiated in Great Britain a series of conferences to discuss the question of the future of the women drafted into industry to take the place of men, the effect of men's wages, and the general standard of living. The precise

effect of this emergency work on the future of women in industry is still obscure, but the scope of women's work must surely be widened and artificial barriers weakened. And beyond this, as stated by an English woman, "the school of thought which thinks and speaks of the nation as men, and believes that only men can produce and serve outside the limitations of the home, must be found guilty of setting up an untrue ideal. . . . Women have not been found wanting, . . . and will earn their reward in the greater freedom that wider avenues of employment will bring them." Similar opinions were expressed in other belligerent countries. During the annual congress of the Union française pour le suffrage des femmes, which represented more than 80 feminist groups, resolutions were passed regarding women's rights as guardians and as members of family councils, the legitimation of children, the simplification of marriage, widows' pensions, care of orphans, the fight against alcoholism, the question of repopulation, the education of women, equal pay, and the demand for women's representation at the peace conference after the war. In Germany, where exactly the same process of the feminization of industries took place as in England and France, the question of equal pay for men and women was much discussed. In Holland one of the main events from the feminist standpoint, in addition to the preliminary enfranchisement of women (which is still subject to a revision of the constitution), was the admission of the first woman privat-docent, Dr. Annie Posthumus, at Amsterdam University, to lecture on modern Scandinavian philology. In Abyssinia a woman, Quizero Zeoditu (q.v.) became empress.

**DEATHS.** Many women prominent in various fields of activity died in 1916. Articles will be found on the following: Janet Achurch (Mrs. Charrington), Inez Milholland Boissevain, Susan Elizabeth Blow, Sarah Knowles Bolton, Lily Braun, Edith Woodman Burroughs, Frank Danby, Jeanne Dieulafoy, Baroness von Ebner-Eschenbach, Elizabeth (Dowager Queen of Rumania, "Carmen Sylva"), Edith M. O. Ellis (Mrs. Havelock Ellis), Jeannette Leonard Gilder, Hetty Green, Clara Louise Kellogg, Emily N. R. McLean (Mrs. Donald McLean), Helen Farnsworth Mears, Naomi Norsworthy, Mary Wright Plummer, Dora Knowlton Ranous, Ada Rehan, Agnes Robertson (Mrs. Dion Boucicault), Madame de Thebes, and Jean Webster. For other deaths, see notes in the **NECROLOGY** list on: Lady Florence Baker, Goswina von Berlepsch, Emily Montague Bishop, Clara Bewick Colby, Elizabeth Wiley Corbett, Mary Davenport, Dora Duncker, Pauline von Erdmannsdörfer-Fichtner, Sarah J. Farmer, Annie Adams Kiskadden, Natalia Macfarren, Sarah Macnaughtan, Mrs. Frederick Marrable, Mrs. Fred Niblo (Josephine Cohan), Louisa Parsons, Molly Elliot Seawell, Minnie Colvin Smith, Virginia Treves-Tedeschi, Pauline Ulrich, and Marie Wiecek.

**Bibliography.** *General:* W. L. George, *Intelligence of Women*; A. R. Hale, *Eden Sphina*; J. and P. Morse, *Feminism*; A. L. McCrimmon, *Woman Movement*; I. M. Tarbell, *Ways of Women*.—*Biographical:* G. Bradford, *Portraits of Women*; F. Izard, *Heroines of the Modern Stage*; E. C. Peabody, *Lives Worth Living*; L. Whiting, *Women Who Have Ennobled Life*. *Social and Economic:* E. Cooper, *Harim and*

*the Purdah*; Z. Hartman, "City Mother" (*Independent*, November 27th); Alice Henry, *The Trade Union Woman*; B. L. Hutchinson, *Women in Modern Industry*; W. M. MacLean, *Woman Workers and Society*; Library of Congress, *Brief List of Legislative and Court Decisions Protecting Women Workers.—War and Connected Problems. General:* Mrs. Havelock Ellis, "Woman and War" (New York *Evening Post*, Sunday magazine, February 5th); Ellen Key, *War, Peace, and the Future*; S. Macnaughtan, *A Woman's Diary of the War*; N. L. McClung, *In Times Like These*; M. W. Sewall, *Woman, World War, and Permanent Peace*. Various countries: Great Britain Ministry of Munitions, *Workers' Commission, Reports* (London); *Report by Commission Appointed by the Director-General of Recruiting for Munitions Work on the Output of Munitions in France* (London); "Employment of Women in Great Britain Owing to the War" (*Economic World*, June); *Report of the Women's Mission to French Farms in February, 1916* (Reading, Eng.); C. V. Butler, *Domestic Service*; Margaret Sackville, "Women and War" (*English Review*, November); F. G. W., Viscountess Wolseley, *Women and the Land* (London); "Women in the Krupp Works" (*Review of Reviews*, September); G. Baemer, "German Women in the War" (*Evening Mail*, New York, August). See also **MARRIAGE AND DIVORCE**; **MINIMUM WAGES**; **PENSIONS FOR MOTHERS**; **WOMAN SUFFRAGE**.

**WOMAN'S CHRISTIAN TEMPERANCE UNION, NATIONAL.** The union held its forty-third annual convention at Indianapolis, Ind., Nov. 17-22, 1916. Officers of 1916 were reflected as follows: President, Miss Anna A. Gordon, Evanston, Ill.; vice-president at large, Mrs. Ella A. Boole, Brooklyn, N. Y.; corresponding secretary, Mrs. Frances P. Parks, Evanston, Ill.; recording secretary, Mrs. Elizabeth P. Anderson, Fargo, N. Dak.; treasurer, Mrs. Margaret C. Munns, Evanston, Ill. It was decided to hold a mass meeting in the interests of national constitutional prohibition in Washington, D. C., on December 10th. The corresponding secretary reported a gain in membership of 18,737. The total receipts of the organization for the year amounted to \$133,526.20 and the disbursements to \$145,229.99. During the year Miss Julia F. Deane, who had been managing editor of the *Union Signal*, an official paper of the W. C. T. U., became its editor, succeeding Miss Anna A. Gordon. The chairman of the committee on publications reported that the publishing house of the organization had put out during the year many millions of pages of printed matter. The president in her address discussed the progress of the year in securing prohibition by law in the United States and other countries. She stated that since the preceding convention eight States had become dry, making a total of 23 States and the Territory of Alaska white on the prohibition map.

**WOMAN SUFFRAGE. UNITED STATES.** For the woman suffrage movement the year 1916 was one of promise and encouragement if not of actual progress. In the United States the interest of the advocates as well as of the adversaries of woman suffrage centred in the presidential election. Never before in the history of this country had the question of woman suffrage played such a prominent part in an election campaign, never before had women displayed

such activity in all parts of the country as during this campaign. Although the success of the group of Eastern women who toured the West in the interest of the Republican candidate has been questioned, the "Women's Special" stands nevertheless as a conspicuous instance of the growing activity and influence of American women in national politics. This was further shown by the stand taken on the suffrage question by the candidates of the contending parties.

On August 1st, Charles E. Hughes, the Republican nominee, announced that he favored unqualifiedly an amendment to the Federal Constitution that would give the vote to women. His general endorsement of woman suffrage in his speech of acceptance, he said, was his approval, as a candidate, of the plank in the Republican platform, whereas his personal conviction was that women should obtain the vote from the national government. On the Democratic side President Wilson, in a letter to the Jane Jefferson Club on August 12th, declared that he would do all in his power to make the Democratic suffrage plank effective. This plank favored the extension of suffrage through State action.

The stand taken by the Democratic party and its candidate was vigorously assailed by suffragists. The National Woman's party, organized (with Miss Maude Younger of California as temporary chairman) by the Congressional Union for Woman Suffrage during the Republican national convention, pledged itself at its executive conference at Colorado Springs, August 1st, to use its best efforts in the 12 suffrage States to defeat the Democratic candidate for President. It congratulated the Progressive, Prohibition, and Socialist parties upon their endorsement of suffrage for women by national action, and commended the position taken by Charles E. Hughes, the Republican nominee. Efforts to obtain a formal endorsement by Mr. Hughes were, however, defeated. The President and the Democratic party were further assailed on August 27th at the opening of the election campaign of the Congressional Union for Woman Suffrage at a mass meeting at Atlantic City, N. J., before an audience of 2100. On September 8th President Wilson addressed the convention of the National American Woman Suffrage Association at Atlantic City, predicting victory for the cause of woman suffrage within a short time and declaring that he had come to fight with them. In his address the President did not mention his previously expressed belief that suffrage should come by action of the States.

The much-debated question whether woman suffragists ought to concentrate their efforts on either the State or the national field was decided at the Annual Convention of the Woman Suffrage Association in September by rejecting proposals in that direction and upholding the established policy of activity in both. A million-dollar fund was voted at the same convention to keep up the suffragists' "lobby" at Washington. Mrs. Carrie Chapman Catt, who had taken office in January as president of the association in succession to Dr. Anna Howard Shaw, was reflected. The National Woman's party chose as its platform the Susan B. Anthony amendment to the Constitution of the United States, "The right of citizens of the United States to vote shall not be denied or

abridged by the United States, or by any State on account of sex." The party stated it would endeavor to consolidate the votes of the 12 Western States where women have been granted the franchise for the presidential candidate who should come out in favor of the Federal amendment. Progress was made on a suffrage hall in Washington as a memorial to Susan B. Anthony.

The importance of the political power of women at the present time may be judged from the fact that 4,000,000 votes were cast by them in the presidential election. Of these 2,000,000 were cast for the first time.

A tragic incident of the election which attracted the attention of the nation to the great sacrifices which women are making for the cause of woman's enfranchisement was the death from exposure and over-exertion while on a speaking tour for the Woman's party of the beautiful and devoted suffragist, Inez Milholland Boissevain (q.v.).

The first national convention of women opposed to woman suffrage was opened at Washington, December 1st, with addresses by Maj. Gen. Leonard Wood, Miss Mabel T. Boardman, member of the American Red Cross Central Committee, and Mrs. Arthur M. Dodge of New York, president of the Association Opposed to Woman Suffrage, at whose call the convention was held. Cardinal Gibbons sent a special message condemning woman suffrage, and former Senator Elihu Root of New York, in a paper on the constitutional phase of the proposed equal suffrage amendment, characterized it as "a destruction of the right of self-government and a subjection of the people of New York to the government of others." Relief work done for the Red Cross by anti-suffrage organizations was the subject of Miss Boardman's address.

A remarkable result of the congressional elections from the point of view of woman suffrage was the election of Miss Jeannette Rankin (q.v.) to Congress on the Republican ticket as representative-at-large from Montana. Miss Rankin, the first woman elected to Congress, is president of the woman suffrage organization in her State. In general, however, the cause of woman suffrage had little progress to register either in State or in Federal legislation. As to Federal legislation the judiciary committee of the House of Representatives, December 14th, ordered the proposed Susan B. Anthony Federal Suffrage amendment (text quoted above) reported without recommendation. The vote was 11 to 8. The House itself struck from the Porto Rican citizenship bill, by a vote of 80 to 59, the amendment adopted May 22nd granting woman suffrage to the island.

*State Legislation.* Aside from the fact that the suffrage question occupied a good deal of the attention of State legislative bodies and of voters, little progress was made toward equal franchise—the Legislature of New York alone taking favorable action. In Maryland a bill to submit to the voters a constitutional amendment granting suffrage to women failed to pass the 1916 Legislature. Likewise in Oklahoma a joint resolution authorizing the submission to the voters of a woman suffrage amendment to the State constitution failed to pass the Senate, although it had been adopted on February 12th by the Assembly. In New York, however, the proposal that another referendum on woman

suffrage be submitted to the voters in 1917 was passed by the Assembly by a vote of 109 to 30 on March 14th, by the Senate 33 to 10, April 10th. In Iowa an amendment providing for woman suffrage was rejected, June 6th, by a vote of 173,024 to 162,683. The Iowa Supreme Court, however, handed down an opinion that women have the right to vote on questions wherein taxation is involved. The decision was given in January in the municipal court and street car franchise election case, when one of the principal points raised against the validity of the election was the fact that women should not have been allowed to vote. A compilation of the decisions on woman suffrage in Illinois showed that Illinois women may vote for presidential electors but not for delegates to national conventions, nor may they take any part in preferential presidential primaries. They may vote for trustees of the State university, but not for a county judge or sheriff. They may not vote for a Governor or Secretary of State or Attorney-General. They may vote for a mayor and aldermen in cities, but not for police magistrates or any judicial officers. Women in Illinois are not allowed to vote for members of the State Legislature nor for Representatives in Congress, nor for committeemen of the political parties, nor may they vote on an amendment to the State constitution. On November 7th suffrage amendments to the State constitutions were defeated in South Dakota by a vote of 58,350 to 53,432, in West Virginia by a vote of 161,607 to 63,540, and in Louisiana (amendment to article 1210 of the constitution, relative to women as office holders) by a vote of 33,132 to 17,636. As to municipal suffrage, women achieved a success at East Cleveland, Ohio, where an amendment to the city charter granting woman suffrage, in so far as voting at all municipal elections and holding municipal offices are concerned, was adopted on June 6th by a vote of 936 to 508.

**CANADA AND MEXICO.** Outside the United States woman suffrage made progress in the western hemisphere by the adoption of woman suffrage in Alberta, British Columbia, Manitoba, and Saskatchewan. In Mexico the women of Yucatan are the first Spanish-speaking women of the world to exercise the privilege of the ballot. Suffrage was granted by the Governor-General of that state following a congress of 3000 women held in Merida.

**EUROPE.** In Europe the year 1916 showed that the cessation of suffrage activity was only temporary and that the war service of women had added force to the demand of enfranchisement. However, critics differ as to the outcome of these years of the feminization of industrial and civic life in Europe. On one point they are agreed—the women of the nations involved in the war gained through the services rendered to their countries during these years the strongest possible support for their demands for equal suffrage when the period of reconstruction begins. In *Great Britain* a promising outlook for a speedy solution of the suffrage problem after the end of the war was given by a statement of Premier Asquith, for years an obstacle in the path of English suffragists, that in future any new bill for franchise reform must include votes for women. In an address before the House of Commons on August 14th, Mr. Asquith declared that the women had presented an un-

answerable case. There have been similar conversions among men of all parties which showed that the capacity and willingness to help in the national cause as displayed by the women during the war has removed the last obstacle to their receiving political recognition and that even after the resignation of the Asquith ministry similar opinions will be held by his successors.

In *France* the annual congress of the Union française pour le suffrage des femmes urged that country to remember the demands of women after the war is ended, and in *Germany* the Frauen-Stimmrechts-Bund addressed a petition to the Reichstag demanding the vote for women. Later in the year the two great suffrage organizations were consolidated into the "German Imperial Association for Woman Suffrage" with the purpose of securing for German women in the separate countries and states the same public rights which are granted to men, and especially to secure the vote and eligibility for legislative and administrative bodies, to urge women in these German countries, counties, and classes that have granted political or any other vote to women, to use such vote, and through political education to work to encourage women to take an active part in all branches of the political and social public life. In *Holland* a bill was introduced in January into parliament to remove the constitutional obstacles placed in the way of women voting for the 100 members of the second chamber and to grant them the right to be elected to office, although it does not give them the ballot. Under its provisions, a woman to vote must be at least 25 years old, assured of a certain minimum yearly income, varying according to locality, and be neither pauper, criminal, nor lunatic. On November 15th the Dutch Parliament passed by unanimous vote a resolution removing the sex disability of women. The actual granting of the vote to women, however, depends on the passing of an electoral bill. On November 17th the Dutch lower chamber voted the eligibility of women to membership in the States-General during a discussion on the revision of the constitution. See also **UNITED STATES, Presidential Campaign; WOMAN MOVEMENT; WOMEN IN INDUSTRY**; articles on various States and countries.

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**WOMEN, EDUCATION OF.** See **UNIVERSITIES AND COLLEGES.**

**WOMEN IN INDUSTRY.** Recent years have witnessed a rapid development of fact and opinion relating to various aspects of the industrial employment of women. This has been reflected in legislation against night work, shortening of hours toward the eight-hour standard, increased prohibitions against the employment of women in dangerous occupations, requirements relating to seats for clerks, rest rooms, and separate toilet facilities, special prohibition of industrial labor immediately before or after

child birth, establishment of maternity pensions, and a very widespread tendency toward the enactment of minimum wage requirements. Matter relating to the employment of women will be found under MINIMUM WAGE; PENSIONS FOR MOTHERS; and PROSTITUTION.

**UNITED STATES.** An interesting aspect of the employment of women in the United States has been their increasing entrance into unique and specialized occupations. Thus library work each year calls for an increased quota of college-trained women. Commercial wireless telegraphy has also been undertaken both on land and sea and several training posts for girls have been established. The number of women investigators increases annually. They are now employed by municipal, State, and Federal governments in numerous kinds of survey and research work. Numbers of women find profitable and congenial labor as architects and illustrators, while in all large cities of the country orchestras composed exclusively of women are found in hotels, restaurants, and theatres. According to statistics of the Government Bureau of Labor, daughters 16 years old and over rival their fathers as providers for the family. The incomes of 2000 families of cotton mill workers in New England and the South were studied and the daughters over 16 in the average family of both North and South were found to be the mainstay. Each daughter earned less than the father, but the average income of the daughters of all the families, of which some had more than one daughter, was higher than the average income of the fathers. The sons over 16 years made better wages than the daughters, but in New England they contributed only 82 per cent of their incomes to the family purse, whereas the daughters contributed 96 per cent of theirs. In the South the amounts contributed were 72 per cent and 89 per cent respectively.

**Shorter Hours Movement.** Appreciating the need of uniform legislation in regard to a shorter working day for women, large numbers of New England women held a conference in Boston in May to consider the best means for promoting passage of a bill covering such a need. This movement for interstate cooperation spread to other sections of the country, and on October 6th-8th the Women's Trade Union Leagues of the Middle West with delegates from Illinois, Ohio, Kansas, Missouri, Kentucky, and Wisconsin, held a conference in Chicago. From discussions it became evident that Congress would soon be asked to pass a bill limiting the work day of all women who are engaged in the manufacture of goods for interstate commerce to eight hours. This bill will be modeled on the lines of the new Federal child labor law. A bill was endorsed by the conference providing for an eight-hour law and a 48-hour week as the minimum demand of women both organized and unorganized. This bill will be presented in nearly the same form in the various States. The conference, though primarily one of trade union women, was heartily backed by branches of the National Consumer's League, women's clubs, suffrage organizations, and the Women's Church Federation. In Wilmington, Del., October 17th, a regional conference on the eight-hour day for women was held. This body adopted unanimously resolutions for campaigning for simultaneous legislation in Congress and the States similar to those of the Chicago conference. For legisla-

tion, see LABOR LEGISLATION, section on Hours.

**IN BELLIGERENT NATIONS.** Doubtless the most important aspect of the employment of women during the past few years has been their entrance in enormous numbers into all branches of manufacturing and trade throughout the nations at war. This tendency continued in even more marked degree during 1916, owing both to the increased demand for labor and to the increased depletion of male workers through military recruiting. Reports from all parts of Europe indicated that there remained scarcely any branch of human industrial efforts into which women had not entered. This was true also in Canada and Australia. Thus on June 14th the Women's Emergency Corps representing 3000 women of Toronto offered their services as industrial workers in order to release men for military duty. This movement in fact seemed likely to amount to a virtual revolution in the industrial and social status of women. Not only did it tend to undermine the strength of trade unions, but it was accompanied by a great extension of governmental regulations of all phases of industry and by a universal recognition of the high services which the labor and patriotic loyalty of women had rendered to their respective nations.

**Great Britain.** The increased employment of women in British industries was strikingly set forth in the Board of Trade *Labour Gazette* for October. Here it was estimated that the total increase in the number of females employed up to July, 1916, was 866,000. This represented an increase of 283,000 since April, 1916. The increase up to July was distributed as follows: industrial occupations, 362,000; commercial, 198,000; professional, 15,000; banking, 30,000; hotels and restaurants, 19,000; agriculture, 66,000; transport (not including municipal), 31,000; civil service, 48,000; arsenals and dockyards, 69,000; and local government employees, 28,000. The total represented an increase of 27 per cent over the numbers employed in July, 1914; and did not include domestic service and the dressmaking trade, which together showed a decrease of 150,000 in the number of girls and women employed. The total, moreover, did not include 27,000 more women attending sick and wounded than in 1914. It was found that women were directly replacing men even in building, mining, and quarrying; that considerable numbers had entered the metal industries; that 25,000 of them had replaced men in the cotton trade; and that women had replaced considerable numbers of men in grain milling, sugar refining, leather working, and in the wood working, glass, china, earthenware, and rubber industries. Railway companies increased their women employees from 11,000 to 33,000; and in municipal work they had entered all lines, including tram drivers and workers on sewage farms, gas works, and road cleaning.

Since January, 1915, for the first time in history the whole world of work has been open to women with the exception of a few occupations necessarily confined to men. A very serious shortage of women's labor chiefly in textile and clothing resulted, and the high wages paid to munition workers was held responsible for this. About 300,000 women were estimated to be doing men's work. By the regulations of the government Munitions' Labor Supply Committee

women on men's work now receive the same piece rates and the same overtime rates as men, are granted bonuses under the same conditions as men, and work on time schedule under similar conditions. This committee has also set 4d. per hour as a minimum wage for women engaged on women's work. For these women overtime rates yield 33½ per cent above usual rates. Sunday work and long hours have been found injurious to woman's health as well as less productive in output. Night work has been found especially harmful in its effects on her health, especially when much of the following day is given up to household tasks. Hence the committee recommended that measures be taken for remedying these conditions. See under LABOR, and WELFARE WORK, paragraphs on *Great Britain*.

*Germany.* German women, like those of France and Great Britain, undertook the work of men in nearly all occupations. Figures comparing the employment of the two sexes showed that on Aug. 1, 1914, the Krupp works employed 36,880 men and 1241 women, the latter only as charwomen, saleswomen, or assistants in shops. By the summer of 1916, however, 14,000 women and 56,000 men were employed. As a result of woman's widespread employment in industry with marked success, a movement was initiated in favor of compulsory government service for women analogous to military service for men. By this plan work will be required of all women except those prevented by motherhood or physical incapacity. Many professional women and those working in social and charitable organizations objected to this service because of interference with their regular professional duties. Also opponents were found in great numbers among the radical groups, both of men and women.

*Bibliography.* S. H. Atherton, *Survey of Wage-Earning Girls Below 16 Years of Age in Wilkes-Barre, Penn., 1915*; E. Gilbert, *Ambitious Woman in Business*; I. J. Graham, *Working Hours of Women and Girls in Chicago*; A. M. MacLean, *Wage Earning Women*; L. C. Odenrantz and Z. L. Potter, *Industrial Conditions in Springfield, Ill.*; E. Packard, *Study of Living Conditions of Self-Supporting Women in New York City*; L. Perry, *Millinery as a Trade for Women*; E. Smith, *Wage Earning Women and Their Dependents*; E. J. Smith, *Maternity and Child Welfare*. Special reports were issued by the Bureau of Occupations for Trained Women (1302 Spruce St., Philadelphia, Pa.), the Massachusetts Minimum Wage Commission, the Women's Educational and Industrial Union of Boston, and the United States Bureau of Labor Statistics. Phases of the employment of British women in war time were treated in reports of the National Union of Women Workers and the Women's Industrial Council, both of London.

**WOMEN'S CLUBS, GENERAL FEDERATION OF.** The Federation, which was organized in 1889, in New York, met in the same city for its 13th biennial convention, May 24-June 1, 1916. About 9000 delegates and others attended the convention. Some 2100 clubs are now members of the Federation. They are to be found all over the United States and even in Alaska and the Canal Zone. The following officers were elected for 1916-18: president, Mrs. Josiah Evans Cowles, Los Angeles, Cal.; first vice-president, Miss Georgie A. Bacon, Worcester, Mass.; second vice-president, Mrs. Eugene Reilly; re-

cording secretary, Mrs. W. I. McFarland, Wagner, S. Dak.; corresponding secretary, Mrs. Francis D. Everett, Hyland Park, Ill.; treasurer, Mrs. William B. Young, Jacksonville, Fla.; auditor, Mrs. William P. Harper, Seattle, Wash. Mrs. Percy V. Pennybacker was the retiring president. See also WOMAN MOVEMENT.

**WOOD, ROBERT WILLIAMS.** See PHYSICS, *passim*.

**WOOL.** See STOCK RAISING AND MEAT PRODUCTION.

**WORCESTER FESTIVAL.** See MUSIC, *Festivals*.

**WORCESTER POLYTECHNIC INSTITUTE.** A non-sectarian institution for the technical education of men at Worcester, Mass. It was founded in 1865. There were 539 students enrolled in the fall of 1916 and the faculty, including assistants, numbered 52. During the year a new professor of physical education was appointed. The institute received by bequest \$55,125. Mr. Charles G. Washburn, president of the corporation of the Institute, gave \$50,000 to it, and buildings and apparatus valued at \$95,019 were also received. In June a new gymnasium was opened. In productive funds the institute had \$921,698, from which it gained an income in 1915-16 of \$42,540. There were 16,000 volumes in the library. President, Ira Nelson Hollis.

**WORKMEN'S COMPENSATION.** Beginning in 1911 a movement for the enactment of workmen's compensation laws rapidly spread over the entire United States. These laws were designed to replace the older employer's liability laws by a system of definite compensation for industrial accidents, and in many cases for occupational diseases, without the necessity of resorting to law suits. The essential principle of the compensation laws is that an employee who suffers an injury while engaged in his occupation should be entitled to a payment proportioned to the injury he receives. In many cases the amount of such payment for specified industries is stated in the law; in other cases, a commission is authorized to fix the compensation under general rules laid down in the act. Whereas formerly not over 25 per cent of the money paid by employers to liability insurance companies finally reached injured employees, under the new laws administration expenses constitute only a few per cent of employers' contributions. New laws became effective in Maine and Pennsylvania on Jan. 1, 1916, in Kentucky on August 1st, and in Porto Rico on July 1st, while the new Federal law went into effect September 8th. There were thus 35 States and Territories having compensation laws; in addition laws had been enacted for Alaska, the Canal Zone, Hawaii, and the United States. Moreover, in harmony with this movement various States have established the principle of compensation in regard to public employees. Compensation laws for private employees are either compulsory or elective. When elective special inducement is given to the employer to come under the law. In a considerable number of States the principle of insurance has been extensively applied in the determination of rates and the administration of the acts. The following States have compulsory laws: Arizona, California, Maryland, New York, Ohio, Oklahoma, Washington, and Wyoming; in the Canal Zone, and in Hawaii. Elective laws have been enacted

in the following States: Colorado, Connecticut, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Montana, Nebraska, Nevada, New Hampshire, New Jersey, Oregon, Pennsylvania, Rhode Island, Texas, Vermont, West Virginia, and Wisconsin, and in the Territory of Alaska.

**LEGISLATION.** The most important enactments of the year were the new laws passed by Congress and by the Legislatures of Kentucky and Porto Rico. South Carolina and Virginia enacted laws establishing employers' liability for railroads. Louisiana made various modifications in the conditions for granting compensation; Massachusetts reduced the waiting period for compensation from 2 weeks to 10 days and made other changes; New Jersey created a "Workmen's Compensation Aid Bureau" to observe the operation of compensation laws in that and other States and countries and report suggested modifications; New York extended the scope of its compensation act, provided elective compensation for non-hazardous callings, and increased the scale of compensation in various respects.

The Kentucky law established an elective system with the proviso that employers not electing it should lose the benefit of the fellow-servant, contributory negligence, and the assumption of risk rules. The act is made to apply to municipalities and other political divisions, as well as corporations and other private employers. In case the injury is due in part to "intentional failure" of the employer to comply with safety laws compensation is increased 15 per cent, whereas it is diminished 15 per cent if similar failure exists on the part of the employee. As usual the employer is required to provide medical, surgical, and hospital treatment; and the State Board is authorized to regulate medical fees. "Contracting out" from the act is prohibited. The scale of compensation provided is standard. Thus in case of death, in addition to burial expense, 65 per cent of weekly earnings, but not less than \$5 nor more than \$12 per week for 335 weeks, and not over \$4000 in total is granted. Proportionate compensations are granted for total disability, temporary disability, and permanent partial disability, with gradations for different degrees of dependency or relationship. The Workmen's Compensation Board is to consist of three members appointed by the Governor for four years at \$3500 a year. All carriers of compensation insurance must report to the State Insurance Commissioner. Moreover, the Kentucky Employees' Insurance Association is created as a mutual corporate body to carry such insurance.

The Porto Rico law is also elective, but the scale of compensation is differently reckoned though equally liberal.

The Federal law provides disability or death benefits for all civil employees of the United States when injury occurs in the performance of public duty, except in case of willful misconduct or intoxication. Medical, surgical, and hospital service and supplies are provided. For total disability the compensation is two-thirds of the monthly pay, but not more than \$66.67 a month, and not less than \$33.33, during continuance of disability. For partial disability compensation is two-thirds of the difference between monthly pay at the time of injury and subsequently. In case of death, in addition to

burial expenses up to \$100, allowance is made of 35 per cent of monthly pay for a widow, and 10 per cent for each child up to a total of 66% per cent; and graded allowances are made for all degrees of relationship and dependency. In computing compensation in case of death monthly pay is considered to be not more than \$100 nor less than \$50. A commission of three members at \$4000 each is created to administer the law; and \$50,000 for administrative expenses and \$500,000 for compensation were made for the fiscal year 1917. In addition a separate fund to be known as the Employees' Compensation Fund was established, with a special appropriation of \$500,000.

**BRITISH COLUMBIA.** A committee to investigate the operations of modern systems of workmen's compensation laws in the United States and Eastern Canada was appointed in British Columbia on Sept. 27, 1915. It visited the States of Washington, Oregon, California, Wisconsin, Ohio, New York, and Massachusetts, and the provinces of Ontario and Nova Scotia, and held hearings at Vancouver. On the basis of its findings a law was enacted May 31, 1916, to become effective Jan. 1, 1917. This law incorporates numerous accident prevention provisions and provides medical benefits in addition to the usual features of workmen's compensation. The act is compulsory and widely inclusive, and requires insurance in a provincial fund. A board of three members to be appointed for terms of 10 years is given extensive powers of inspection and regulation. While the entire cost of compensation is placed on the employer he is required to deduct one cent each day from the wages of employees for a medical-aid fund. Liberal benefits are provided in case of death for widow, invalid widower, and each child under 16; orphan children receive double benefits. For total disability the compensation is 55 per cent of workmen's wages, but not less than \$5 per week. Partial disability is compensated on the basis of wage loss.

**Bibliography.** Among 1916 publications may be mentioned the following: J. F. Connor, *Employers' Liability, Workmen's Compensation, and Liability Insurance*; W. M. Glass, *Law of Workmen's Compensation*; Insurance Federation of Minnesota, *Up-to-Date Facts About Workmen's Compensation*. Reports were issued by the industrial accident boards or workmen's compensation bureaus of California, Connecticut, Hawaii, Illinois, Kentucky, Louisiana, Maine, Maryland, Michigan, Minnesota, Nebraska, New York, Ontario, Oregon, Pennsylvania, Vermont, Washington, and Wisconsin. The Workmen's Compensation Publicity Bureau of New York City issued various pamphlets during the year.

**WOUNDS, WAR. See SURGERY.**

**WRESTLING.** The winners of the Amateur Athletic Union wrestling championships held at Newark, N. J., were: 108-pound class, George Taylor, National Turn Verein, Newark; 115-pound class, Kalmar Borsits, Gary, Ind., Y. M. C. A.; 125-pound class, C. Lijehult, Bronx Church House, New York; 135-pound class, William Hallas, Greek-American A. C., Chicago; 158-pound class, William Americus, Greek-American A. C., New York; 175-pound class, N. G. Pendleton, New York A. C.

Cornell for the fourth year in succession won the inter-collegiate championship, with Princeton second and Lehigh third. The winners of



the various bouts were: 115-pound class, Wiss, Princeton; 125-pound class, Wigten, Cornell; 135-pound class, Hess, Lehigh; 145-pound class, Milligan, Pennsylvania; 150-pound class, Saeger, Cornell; 175-pound class, McKeage, Cornell; unlimited class, Dorizas, Pennsylvania.

Professional wrestling instruments were held in various cities throughout the United States, Joe Stecher making the best showing. He defeated among others "Cyclone" Burns, John Perelli, Joe Rogers, Dr. Ben F. Roller, and Americus, and battled to a draw with "Strangler" Ed Lewis. The international tournament held at New York City was won by Alexander Aberg.

**WUNDT, WILHELM.** See **PSYCHOLOGY, Social Psychology.**

**WÜRTTEMBERG.** A European kingdom, one of the more important of the constituent states of the German Empire. The capital is Stuttgart. See **GERMANY, section Area and Population.**

**WYOMING. POPULATION.** The estimated population of the State on Dec. 31, 1916, was 182,264. The population in 1910 was 145,965.

**AGRICULTURE.** The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1915-16, were as follows:

	Acreage	Prod. Bu.	Value
Corn .....	1916 25,000	550,000	\$495,000
	1915 35,000	875,000	536,000
Wheat .....	1916 165,000	3,560,000	5,162,000
	1915 125,000	3,315,000	2,586,000
Oats .....	1916 245,000	8,575,000	5,145,000
	1915 227,000	9,584,000	4,100,000
Potatoes .....	1916 18,000	2,340,000	2,995,000
	1915 17,000	2,550,000	1,530,000
Hay .....	1916 580,000	1,044,000	12,528,000
	1915 550,000	1,210,000	9,488,000
Rye .....	1916 10,000	155,000	167,000
	1915 12,000	240,000	216,000
Barley .....	1916 25,000	825,000	718,000
	1915 17,000	612,000	337,000

a Tons.

**MANUFACTURES.** The census for manufactures, taken in 1914 and completed in so far as the figures relating to the individual States are concerned in December, 1916, disclosed the following comparative condition of manufactures in 1909 and 1914:

	1909	1914
Number of establishments.....	268	337
Average number of wage earners	2,867	2,989
Capital invested .....	\$8,195,000	\$29,270,000
Wages .....	2,081,000	2,312,000
The value of materials used....	2,608,000	5,560,000
The value of products.....	6,249,000	11,224,000

**MINERAL PRODUCTION.** The coal production of the State in 1916 was 7,500,000, an increase compared with 1915 of 946,000, or 14 per cent. The increase is attributed mainly to greater consumption of coal by railroads. The car supply was nearly equal to requirements except in September and October. The supply of labor was short in November and December.

The coal mined in the State in 1915 was 6,654,038 short tons. The total value was \$10,033,347, compared with \$9,555,804 in 1914. The number of men employed in the coal mines of the State during the year was 7244, compared with 8117 in 1914. There were produced in the State in 1915 4,245,525 barrels of petroleum,

compared with 3,566,335 barrels in 1914. The iron mined in the State in 1915 amounted to 434,513 gross tons, compared with 366,962 tons in 1914. The total production of gold, silver, and copper in 1915 was \$93,296 as compared with \$7384 in 1914. The greatest increase was in copper.

**TRANSPORTATION.** The total railway mileage of the State is about 2000. The roads having the longest mileage are the Union Pacific, 470; the Chicago, Burlington, and Quincy, 236. The total value of the railways of the State is \$51,885,420.

**EDUCATION.** The total school population of the State in 1915 was 37,595. The enrollment was 30,816. There were 223 male, and 1411 female teachers. The average monthly salary of male teachers was \$82.96 and of female teachers \$58.41.

**FINANCE.** The report of the State Treasurer for the fiscal year 1914-16 shows a balance on hand Oct. 1, 1914, of \$718,426. The total receipts amounted to \$3,559,029, and the disbursements to \$2,718,117, leaving a balance on hand Sept. 1, 1916, of \$1,046,606.

**CHARITIES AND CORRECTIONS.** The charitable and correctional institutions include State Hospital for the Insane at Evanston, Wyoming State Penitentiary at Rawlins, Wyoming Soldiers' and Sailors' Home at Buffalo, Big Horn Hot Springs Reservation at Thermopolis, General Hospitals at Sheridan, Rock Spring, and Casper, the Wyoming School for Defectives at Lander, Wyoming Industrial School at Warland.

**POLITICS AND GOVERNMENT.** The political campaign in Wyoming in 1916 abounded in surprises. The official count gave to President Wilson a plurality of 6618 votes over Mr. Hughes, in spite of the fact that it was expected that the State would go Republican by 2000. John B. Kenrick, Democratic candidate for United States Senator, defeated Clarence D. Clarke, who was a candidate for reelection, by 3066 votes. Frank W. Mondel, Republican, who had represented Wyoming in the lower house of Congress for 20 years, was reelected by 537 votes. The Republicans as usual carried both branches of the Legislature—by a majority of five votes in each house. The Republican party has been more or less divided since the insurgent revolt in 1910. While most of the Progressives in 1912 were Republicans under novel conditions some of the influential leaders like John M. Carey, former Governor, campaigned the State for Mr. Wilson. The two factors which are responsible for President Wilson's victory in Wyoming were the belief that he kept the country out of war and his efforts in behalf of the Adamson eight-hour law. During the year the State was in a highly prosperous condition industrially and financially.

**STATE OFFICERS.** Acting Governor, Frank L. Houx; Secretary of State, Frank L. Houx; Treasurer, Herman B. Gates; Auditor and Commissioner of Insurance, Robert B. Forsythe; Adjutant-General, R. Anderson; Attorney-General, D. A. Preston; Superintendent of Public Instruction, Edith K. O. Clark; Houx, Anderson, and Preston, Democrats, others Republicans.

**JUDICIARY.** Supreme Court: Chief Justice, Charles N. Potter; Associate Justices, Cyrus Beard, and R. H. Scott; Clerk, W. H. Kelly.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Republicans .....	16	31	47
Democrats .....	11	26	37
Republican majority..	5	5	10

**WYOMING, UNIVERSITY OF.** A co-educational State institution at Laramie, Wyo. In the academic year 1915-16 there were 573 students and 75 instructors. The productive funds of the university amounted to \$92,047 and the total income from all sources was \$258,493. There were 39,000 volumes in the library. President, Clyde Augustus Duniway.

**X-RAYS.** See CHEMISTRY, GENERAL; PHYSICS.

**YACHTING.** No international yachting races were held during 1916, Sir Thomas Lip-ton's *Shamrock IV* remaining in drydock at the Erie Basin, Brooklyn. The year, nevertheless, was an active one in yachting circles, more than 50 new boats being added to the already long list of racing craft.

The New York Yacht Club staged 96 races on its annual cruise, which lasted 14 days. The winners of the more important contests were: Navy Challenge Cups, *Amorilla* and *Lesmona*; Alumni Association, U. S. N., *Miladi* and *Okee*; Rear Commodore's Cups, *Elena* and *Flying Cloud*, *Aurora* and *Jessica*; Commodore's Cups, *Irolita* and *Flying Cloud*, *Barbara* and *Okee*; Vice-Commodore's Cups, *Elena* and *Amorilla*, *Aurora* and *Squaw*; Astor Cups, *Elena* and *Aurora*; King's Cup, *Elena*.

Morton F. Plant's *Elena*, which he later sold to Cornelius Vanderbilt, was the star schooner of the season, defeating Robert E. Tod's *Katoura* in the ocean race for the Cape May Cup in addition to winning the chief trophies on the New York Yacht Club cruise.

The disqualification of the Quincy, Mass., Yacht Club's "P" class sloop, *Ahmeek*, owned and sailed by Charles Francis Adams, was the only unfortunate occurrence of the season. After the *Ahmeek* had been returned victor over 11 other sloops of her class in three races on Long Island Sound it was found that she carried 30 feet more canvas than the rules allow. First prize was therefore given to the *Nahma*, representing the Indian Harbor Yacht Club. Addison G. Hanan, owner of the *Nahma*, however, refused to accept the trophy and returned it to the original donor, the Manhasset Bay Yacht Club, accompanied by a challenge to sail a race for the cup in 1917.

The feature of the year in motor boating was the remarkable showing made by *Miss Minneapolis*, a 20-foot hydroplane built by popular subscription for a syndicate named the Miss Minneapolis Boat Association. This craft broke all records by covering a half-mile on Put-in-Bay at a speed of 65.7 miles an hour. *Miss Minneapolis* also captured the Gold Challenge Cup, racing at Detroit against five other boats, her speed average for the three races being 48.6 statute miles an hour. The *Hawkeye* won the first of a series of races for the Thousand Islands Challenge Cup.

**YADKIN RIVER DAM.** See DAMS; WATER POWER.

**YALE UNIVERSITY.** A non-sectarian institution at New Haven, Conn., founded in 1701.

The Graduate School, Art School, and School of Music are co-educational. In the fall of 1916 the total enrollment of students was 3251 and the faculty numbered 365, not including assistants. During the year Prof. Henry A. Beers, for long senior member of the department of English in Yale College, retired, and Dean Henry Wade Rogers of the Law School resigned after his appointment as judge of the United States Circuit Court. The following important additions to the faculty were made: Ernest Fox Nichols (formerly president of Dartmouth College), professor of physics; Walter Wheeler Cook, professor of law; Thomas Sewall Adams, professor of political economy; Thomas Walter Swan, professor and dean of the Law School; Luther Allan Weigle, Horace Bushnell professor of Christian nurture; Austin Morris Harmon, professor of Greek and Latin. Dr. Wilbur L. Cross, formerly professor of English in the Sheffield Scientific School, was appointed dean of the Graduate School, and Andrew Keogh, formerly reference librarian, was appointed university librarian. In the interest of administrative efficiency it was decided to reorganize the Graduate School, grouping the faculty in three divisions. A university Board of Health was established and Dr. James C. Greenway was appointed university health officer. A new building was begun for the Sprague Memorial Music School. Payments received during the year on account of the estates of Justus S. Hotchkiss, Lord Strathcona and Mount Royal, Brayton Ives, and Matthew C. D. Borden amounted to over \$1,600,000. From Mrs. Dotha Bushnell Hillyer was received \$100,000 to found the Horace Bushnell Memorial professorship fund. In 1916 the productive funds of Yale University amounted to \$18,431,444 and from all sources an income of \$1,872,108 was obtained. There were approximately 1,000,000 volumes in the library. The university was included in the plan of the National City Bank of New York to offer fellowships for the bank's course in foreign banking and commerce, providing work and pay in summer and assuring positions on graduation. Six such fellowships were accepted by Yale. On October 20th, 21st, and 22nd the university celebrated the two-hundredth anniversary of its removal to New Haven. Elaborate preparations were made for the event and the programme included a masque by John Jay Chapman entitled *Cupid and Psyche*, commemorative addresses, church services, a city celebration, and a great historical pageant staged in Yale Bowl. Eight thousand persons took part, and there were 40,000 spectators. Some of the scenes presented were particularly impressive in a spectacular way and for the attention given to details as well as to the mass effect (see also MUSIC, *General News*). During the year the university lost by death Dr. Timothy Dwight (q.v.), the revered president emeritus of the institution. President, Arthur Twining Hadley.

**YEATS, WILLIAM BUTLER.** See LITERATURE, ENGLISH AND AMERICAN, *Essays*, English.

**YELLOW JACKET, THE.** See DRAMA.

**YOUNG MEN'S CHRISTIAN ASSOCIATION.** The central control of this organization is vested in the International Committee of the Young Men's Christian Association, which has its headquarters at 124 East 28th Street, New York City. In 1916 the committee had 100

members, all of them Christian laymen (chairman, Alfred E. Marling; treasurer, B. H. Fancher; general secretary, John R. Mott). *Association Men*, the official magazine of the association, is published monthly. In the home field in 1916 there were 121 executive, traveling, and office secretaries and in the foreign field (Asia, Africa, Latin America, and Eastern Europe) 199 secretaries. The associations in North America numbered 2757, with a total membership of 689,023. Their 782 plants and buildings were valued at \$83,263,439, and the aggregate property at over \$106,000,000. The local associations, with 4353 secretaries and other paid officers, enrolled 152,160 men and boys in Bible classes and 82,358 different men in education courses; 477,731 members benefited by various physical privileges. The men for whom employment was found numbered 63,148. Total operating expenses for all the associations amounted to \$15,812,259. New buildings costing altogether more than \$6,000,000 were opened in 1916. Of 33 such buildings the most notable were at Chicago (Chicago Men's Hotel); Rochester, N. Y.; Springfield, Mass.; Greenwich, Conn.; Yonkers, N. Y.; Great Falls, Mont.; Racine, Wis. Toward more than 40 other new buildings \$8,900,000 had been pledged at the end of 1916. Buildings were completed or in course of construction in the foreign field at Havana, Cuba; in China at Canton, Foochow, Hongkong, and Hankow; in Japan at Yokohama and Tokyo; and in India at Calcutta.

The Thirty-ninth International Convention was held at Cleveland, Ohio, May 12-16, 1916. It was reported that for 29 months Y. M. C. A. work was maintained in encampments in Texas. With regard to the Y. M. C. A. activities for the benefit of men and boys engaged in the European war, it was stated that the greatest opportunities for the American organization had been found in the armies of France and Austria-Hungary. Much was done in the prison camps. During the first 17 months of the war \$300,000 was expended and it was expected that \$400,000 would be expended in 1916. Some 70 secretaries and other workers were employed in this field.

**YOUNGSTOWN STRIKE.** See STRIKES.

**YOUNG WOMEN'S CHRISTIAN ASSOCIATION.** The Young Women's Christian Associations in the United States are united through the agency of a National Board, which has its headquarters at 600 Lexington Avenue, New York City. Through this board the associations participate in the work of the World's Young Women's Christian Association. In addition to supervising local associations through 11 field committees, a staff of 128 headquarters and field secretaries promotes such specialized activities as: visiting and teaching immigrant women and girls; benefiting farm girls through county associations; helping young business women by vocational guidance, summer camps, etc.; establishing club houses for nurses and art students; offering opportunities to colored and Indian students; and interesting leisured women and college alumnae in philanthropic and religious work. Through a staff of 45 American secretaries abroad, the board extends its work to India, China, Japan, South America, and Turkey. In 1916 provision was made for 15 city, student, and county conferences and seven industrial or high school councils, in

which 6476 young women were given 10 days of rest, recreation, and religious instruction. At the end of 1916 the total number of local associations in the United States was 1004, consisting of 258 city associations, 727 student associations, and 19 county associations, with a total membership of 364,673. At the beginning of 1916 the number of employed officers was 1881. Bible study, mission study, educational and physical education classes were maintained. Employment bureaus found positions for 67,000 girls. The real property of the associations had a total value of \$12,444,879. Their expenditures for the year amounted to \$303,733.33, and the receipts of the National Board were \$337,942.12. The board publishes the *Association Monthly* and maintains a Training School for Y. W. C. A. workers. President of the board, Mrs. Robert E. Speer; general secretary, Miss Mabel Cratty.

**YUAN SHIH-KAI.** A Chinese statesman, first President of the Republic of China, died in Peking June 6, 1916. He was born in Honan Province in 1859, the son of a district governor. Educated for official position, he went into the army in 1882, serving as a secretary. His ability brought him to the attention of Li Hung Chang, then Grand Chancellor, who made him Chinese Resident at Seoul, Korea, in 1885. This office he held till the Chino-Japanese War in 1894, before which time he had gained for China the upper hand in the country. After serving a short time as judicial commissioner of Pechihli Province, he was placed in command of an army corps (1897). In 1898 Yuan, who by this time had become one of the principal advisers of the Emperor Kwang-sü, was involved in the Emperor's plot to gain a free hand for his reforms by placing the Empress Dowager, Tze Hsi, in confinement; but instead of carrying out his share in the plan, Yuan warned the Empress. She was thus enabled to execute a *coup* by which she was restored to power and Kwang-sü was virtually deposed.

As a reward for his services, Yuan was made junior vice-president of the Board of Works, and then Governor of Shantung. At the time of the Boxer Rebellion he avoided gaining the enmity of the Boxers, and at the same time effectively protected foreigners. As Acting Viceroy of Pechihli Province, from 1901, Yuan steadily gained in power, especially by a reorganization of the army. He was brought to Peking in 1907 to be grand councilor and president of the Chinese foreign office. Then came the death of the Empress Dowager and of Kwang-sü in 1908, within a day of each other, and upon the assumption of the regency by Prince Chun, Yuan was at once banished—sent off to “nurse a sore foot.” His enemies accused him of intrigues mysteriously connected with the death of the Emperor and Empress, and claimed that by being banished he escaped decapitation; but Prince Chun's enmity was natural, for he was a brother of Kwang-sü, and he could not forgive Yuan's defection in 1908. However, by 1911, an anti-Manchu rebellion had broken out and the Regent, who had already made several vain efforts to get Yuan back, sent for him in haste, appointing him Viceroy of Hupeh and Hunan and commander in chief of all the forces of the North. Prince Chun, as a sop to the revolutionists, made Yuan premier of a “responsible” cabinet. This did not sat-

isfy them, and the abdication of both the Regent and the boy Emperor, Hsuan-tung, was forced. In February, 1912, an imperial edict, which sounded the death knell of the Manchu dynasty, authorized Yuan to organize, in co-operation with the rebel leaders at Nanking, a republican form of government. The Emperor was merely to retain his title and religious functions and draw an annuity.

In December, 1911, Dr. Sun Yat-sen, a great liberal leader, who, with his followers, was working to overthrow the monarchy, had been elected by delegates assembled at Nanking provisional President, but although he was not hopeful that Yuan would give the country a really republican form of government, he resigned in favor of that leader in the following February. Yuan was then elected to the same office, and on Oct. 6, 1913, he was regularly chosen to the presidency by the Chinese Parliament, receiving a large majority over the other two candidates, Dr. Sun and Wu Ting-fang, who had been ambassador at Washington.

The opinion of Yuan's opponents, that his ambition would lead him to seek dictatorial power, seemed to be justified by his conduct in office. Risings in the South were severely dealt with, and Dr. Sun was forced to take refuge in Japan. After he had been at odds with the Parliament for some time, Yuan finally dismissed it (Jan. 10, 1914) and the next May he created an advisory council, or provisional congress, the members of which were all appointed by Yuan himself. He also abolished provincial assemblies and municipal councils, gradually gathering all the reins of government into his own hands. One of his remarkable acts was the restoration of Confucianism as the state religion.

In 1915, after Japan had exacted a number of concessions from China, there appeared to be a sentiment in some quarters that a return to the monarchy would be desirable. A citizens' convention was held, and it was announced that 15 out of 18 provinces and 1993 out of 2043 representatives favored the change. From subsequent developments, however, it would seem that this decision did not by any means indicate the real feeling of the people. However, in the summer of 1915, Yuan made it known that he intended to ascend the throne, stating that the country was in no condition to flourish under a republic.

Serious opposition at once developed. Not only did the rebellious Southern provinces revolt, but many leaders who had previously supported the President urged him not to take this step. From abroad the return to a monarchy was frowned upon by governments that had been most friendly to Yuan, and the high displeasure of Japan at the prospect was expressed in no uncertain terms. Unrest became general. The coronation, originally set for February, 1916, was postponed several times, and finally it was announced that China would remain a republic. Even the Vice-President, Li Yuan-hung (q.v.), had deserted his chief and joined the protestants; he now came back, and was ready to assume the presidency on the death of Yuan. His sympathy with the ideas of the Southern leaders and assured support from the Premier, promised well for his success in uniting the liberal factions. Whether Yuan Shih-kai died a natural death or was put out

of the way by his enemies may never be known. Several days before his death, which was said to be due to "stomach trouble" and nervous breakdown, it was reported that he had been poisoned, a report that was officially denied. Another version had it that he had committed suicide. Certain it is that several times attempts had been made on his life.

**YUKON.** A territory of the Dominion of Canada, east of Alaska and west of the Northwest Territories. Area, 207,076 square miles, of which 649 are water. Between 1901 and 1911 the population decreased 68.73 per cent, or from 27,219 to 8512 (6508 males, 2004 females). The capital is Dawson, which in 1901 had 9142 inhabitants and in 1911 3013. The territory is governed by a commissioner and a legislative council of 10 elected members. It is represented by one member in the Canadian House of Commons. The commissioner in 1916 was George Black; gold commissioner and crown timber and land agent, George P. Mackenzie.

**YUSUF IZZEDDIN.** Heir presumptive to the throne of Turkey, died Feb. 1, 1916. He was born in 1857, the son of Sultan Abd-ul-Aziz, and cousin of the prince who became Mohammed V, Sultan at the time of Yusuf's death. He became known for pro-British sympathies, and for his opposition to the Turkish leader and Minister of War, Enver Pasha. With this powerful pro-German Ottoman, Yusuf had once exchanged revolver shots. It was reported that he committed suicide, but to many it seemed probable that this act was forced upon him or that he was murdered.

**ZAMACOIS, MIGUEL.** See FRENCH LITERATURE, *Poetry*.

**ZANGWILL, ISRAEL.** See LITERATURE, ENGLISH AND AMERICAN, *Essays*, English.

**ZANZIBAR.** A British protectorate composed of the islands of Zanzibar (640 square miles), Pemba (390), and several smaller islands. The island of Zanzibar is separated from the mainland by a channel whose narrowest crossing is 22½ miles. A mixed population (Swahili) made up of representatives of all the east African tribes composes the majority of the inhabitants, who totaled at the 1910 census 197,199 (114,069 in Zanzibar, 83,130 in Pemba). The islands yield the bulk of the world's supply of cloves; other exports are coconuts, copra, chillies, etc. Imports 1914, £763,405; exports, £814,952; revenue, £234,701; expenditure, £213,091. Reigning Sultan, Seyyid Khalifa bin Harub; British Resident, Maj. F. B. Pearce.

**ZEODITU, OUIZERO.** Daughter of the late Emperor Menelik of Abyssinia, succeeded to the throne in September, 1916, after Menelik's grandson had been deposed. See ABYSSINIA.

**ZEPPELIN AIRSHIPS.** See AERONAUTICS; MILITARY PROGRESS.

**ZIMMERMANN, ALFRED F. M.** German statesman, became head of the German foreign office in succession to Gottlieb von Jagow, whose resignation was reported Nov. 22, 1916. Dr. Zimmermann, who had become known for books relating to international politics, had been an under secretary during the war in the foreign office.

**ZINC.** The zinc mining and zinc smelting industries experienced a year of prosperity in 1916. According to the best information available at the end of the year the recoverable zinc content of ore mined in the United States was

about 708,000 tons, compared with 605,915 tons in 1915. The largest district mined was made by the Joplin mines, which had an increase of over 40,000 tons. Montana made a notable gain and apparently took second place. Gains were made also in the Upper Mississippi Valley region. The Eastern States produced 148,000 tons, the Central States 274,000 tons, and the Western States 286,000 tons. There was much activity in the construction of retort zinc smelters in 1916, and considerable additions are planned for 1917. The number of retorts at the beginning of 1916 was 156,560. At the end of the year it was 213,840. The production of spelter from domestic ore was 553,000 short tons, worth about \$150,000,000, and from foreign ore 105,000 tons. The total of 658,000 tons was worth \$180,000,000, compared with a total of 489,519 tons in 1915, valued at \$121,400,000. Illinois showed the largest production of spelter, followed by Kansas and Oklahoma.

**IMPORTS AND EXPORTS.** Imports of spelter sheets made from domestic ore in 1916 were about 167,000 short tons, valued at \$52,200,000, compared with 118,603 tons, valued at \$29,537,880 in 1915. Exports of spelter made from foreign ore were estimated at 43,500 tons, valued at \$7,500,000, compared with 13,730 tons in 1915. The exports of zinc manufacturers fell off to \$573,000 in 1916 from \$2,173,089 in 1915. The imports of spelter are estimated at 600 short tons valued at about \$100,000, compared with 104 tons in 1915. The imports of zinc ore in 1916 were approximately 360,000 short tons worth about \$11,800,000, compared with 158,852 tons in 1915. See also METALLURGY.

**ZIONISM.** See JEWS AND JUDAISM.

**ZONING REGULATIONS, MUNICIPAL.** See CITY PLANNING.

**ZOOLOGY.** In the United States, the year has produced about the usual amount of zoological research, both in pure science and in various economic lines; the latter mainly in connection with Federal or State agricultural research. The completion of permanent buildings for the Marine Biological Laboratory at Woods Hole, Mass., and for the Scripps Institution at La Jolla, Cal., has provided the country with splendidly equipped research laboratories, open at all seasons of the year. In Europe the war has of course interfered seriously with productive scholarship. So far as Germany is concerned, little or no account of the research work has reached the United States. How much of this lack is due to non-productivity and how much to the refusal of the British censor to allow German publications to pass, it is not possible to state. The Naples Zoological Station has been taken over by the Italian government, which has placed it under the control of a royal commission, with Prof. F. Sav. Monticelli of the University of Naples as president. This commission announced that facilities would be offered as before for the carrying on of research. The *Zoologischer Jahresbericht*, formerly published by this station, has been discontinued, the last volume being for the year 1912. The *Bibliographica Zoologica*, which has been edited by an international committee since 1896, was until 1912 published with the *Zoologischer Anzeiger*, though since 1909 the printing was done in Zurich. The director announced in December, 1916, that in spite of difficulties arising from the war, the volumes are being published, vol.

xxx being then in the press. Expenses of publication have been met by private subscriptions and by aid from the Swiss government.

The International Commission on Zoological Nomenclature ruled that *Holothuria* and *Physalia* shall be used with the customary application, a suspension of ordinary priority rules being desirable in this case. This commission, in *Smithsonian Institution Publications No. 2409*, gave a list of 102 officially recognized names of birds.

Some years ago the opinion was expressed that aquatic animals might extract nutriment from materials in solution in the water passing through their bodies, but it seemed doubtful if enough could be obtained in this way. As bearing on this question, Hecht calculated the amount of water passing through the branchial chamber of an ascidian, *Ascidia atra*, and found that a moderate sized individual would pass as much as 173 litres per day. He did not attempt to estimate the amount of nutriment it might have obtained from this water. Churchill, working on fresh water mussels, got evidence that fats in the water would be absorbed directly by the mantle, albumen by the outer body wall, and starch by the gills. These results make it reasonable to conclude that when living in ordinary river water, with much organic matter in solution, an appreciable amount of the nutriment may be obtained by absorption.

**HEREDITY.** Morgan and his students continued their analysis of the hereditary processes in *Drosophila*, the fruit fly. As has been noted in earlier YEAB BOOKS, they locate the carriers of heredity in the chromosomes, and have gone so far as to plot on individual chromosomes the precise position occupied by different determiners. Of importance is the behavior of the "X" chromosome, the distribution in heredity of certain sex-linked characters following with great accuracy the distribution of this chromosome. Bridges has discovered, in what appear at first sight to be exceptions to the usual rule in such cases, what seems to be in reality confirmation of the accuracy of the original hypothesis. In a crossing where the male has a dominant sex-linked character which is not present in the female the assumption is made that this dominant character is carried by an X chromosome present in the male. The female has two X chromosomes, while the male has but one. If we represent by an underscored X the carrier of the dominant character, the formula of the male cell would be  $\underline{X}Y$ , and of the female  $XX$ . (The Y in the male refers to a chromosome which is associated with the X, but has no relation to the sex-linked character.) Thus the sex cells of the male after maturation would contain either an  $\underline{X}$  or a Y, while each mature egg would contain an X. An X egg fertilized with an  $\underline{X}$  spermatozoon would have the formula  $\underline{X}X$  and would be a female showing the dominant character. An X egg fertilized by a Y spermatozoon would have the formula XY and would be a male, but without the sex-linked character. Thus the daughters are like the father, and the sons like the mother.

In the majority of breeding experiments on *Drosophila*, the results are in agreement with the assumptions thus far made, and hence tend to substantiate the hypothesis. In some cases, however, the daughters resemble the mother and the sons resemble the father, results which

seem opposed to these conclusions. Bridges supposes, however, that in these cases the exceptional conditions have arisen in some individuals through the failure of the X chromosomes to separate in maturation, a condition which he calls non-disjunction. Thus an egg after maturation might contain both X's and have the formula XX, or it may have thrown both out with the polar body, and the formula O. Fertilized with the two kinds of spermatozoa the results would be as follows:

- XX egg + X spermatozoon gives XXX a female.  
 XX egg + Y spermatozoon gives XXY a female like the mother.  
 O egg + X spermatozoon gives XO a male like the father.  
 O egg + Y spermatozoon gives OY.

Bridges actually obtained individuals corresponding to the second and third of these groups, though the male was sterile. The female was fertile and further breeding with her, in crossings calculated to analyze the chromosomal characters, indicated that they agreed entirely with the hypothesis. The apparent exceptions, therefore, really add strength to the theory. Confirmatory evidence was obtained by a microscopic examination of the chromosomes of aberrant females where peculiar arrangements of these chromosomes could be observed.

Since males of the formula XO are sterile while the normal fertile male has the formula XY, it appeared to Bridges that the Y has some definite function, and is not merely "a gear wheel in the mechanism of synapsis and reduction."

Bateson, the leading English student of genetics, has in his various writings (see *YEAR BOOK* for 1907, article *BIOLOGY*) been very skeptical of the theory that hereditary characters are as intimately associated with the chromosomes as has been maintained. In a review of "The Mechanism of Mendelian Heredity" by Morgan and others (see *YEAR BOOK* for 1915, article *ZOOLOGY*) he admits that this work of Morgan and his associates has strengthened the theory, but still finds it difficult to believe that the chromosomes can be sufficiently complex in structure to warrant its acceptance. Since the number of independently variable characters possessed by any individual is much in excess of the number of chromosomes in it, this theory must assume a complex grouping of characters along the chromosome, and Bateson did not believe that the facts in our possession warrant this assumption.

Davenport, as a result of the study of family histories, stated that nomadism, or a tendency to wander, and violent temper are inherited in accordance with Mendel's law. A "violent temper" is really the presence of a feeble inhibitory power, and it is this feeble inhibition which is inherited. A theoretical calculation showed that in mating controlled with uncontrolled 50 per cent of the offspring resemble one parent, and 50 per cent the other. Field workers collected data showing that the actual proportions were 106 to 113, a result quite in agreement with the expectation. In an earlier paper Davenport stated that congenital cataract is a dominant character and based his eugenic advice on that position. The subject was reinvestigated by Jones and Mason, who stated that

this character is a recessive, and that eugenic advice based on Davenport's conclusions is apt to lead to unfortunate consequences.

Since the publication in 1877, of Dugdale's book on the "Jukes" family, this has been a stock illustration of the persistence of criminality or mental deficiency in human heredity. Estabrook published through the Carnegie Institution of Washington, a study of the condition of the family in 1915. He was able to secure data concerning 1258 members who were living in that year. One-half of these are feeble-minded, and not capable of responding normally to the demands of society, while the other half become socially adequate or inadequate, depending on the environment. He concluded that all of the criminal Jukes are feeble-minded, and to eliminate this criminality we must eliminate the feeble-mindedness. Out of 600 epileptic or feeble-minded Jukes only 3 are in custody, but by proper segregation of the 600 he thought the mental deficiencies could be eliminated in 50 years. It might thus be possible to eliminate the feeble-minded and to improve the others who are capable of responding to normal conditions by improving their environment. Davenport, in discussing this paper, expressed the opinion that to scatter individuals among a good environment might result in starting so many new foci of socially undesirable communities.

Davenport has stated that the combs of fowls are determined as to form by separate determinants acting either separately or in combination, and similar results are reported by Bateson. Stephenson was unable to find any special determiners, but thinks that in the single and the V-shaped comb as well as in the Y resulting from their crossing, the comb arises as the last step in a series of differentiations which have given rise to the whole head structure. The form of the comb is then due to the interactions of forces which have given rise to all of the other parts of the head, and is not in any way due to determinants relating particularly to it.

Castle and his students have continued their analysis of the coat colors of guinea pigs and rabbits. From a study of the native guinea pigs from Peru, which Castle considers the ancestral form, he concluded that varieties have arisen through loss of variations, and thus black, brown, yellow, and white forms have appeared as a result of the loss of characters present in the wild variety. Castle thought that as a result of the long period that these have been bred by the Peruvians they have undergone more modifications than any other domesticated mammal.

Osborn thought that baldness is an hereditary condition, and not due to the wearing of tight hats, and he gave photographs showing that the bald area is above the line of hat pressure and so cannot be due to this. He thought that the evidence indicated that baldness is a sex-linked character, becoming apparent in the male when simplex, but showing in the female only when duplex. Like other sex-linked characters, it may be transmitted through the female, even if not evident in her.

It has been questioned whether in breeding for high egg production in fowls there is not an accompanying decrease in the stamina of the race. Dunnicliff, working in New South Wales, states that there is no reason to fear this result, and that while physical degeneration may

appear in selected stock, this is not the result of selection for fecundity.

A German eugenic society for the improvement of the race has been formed to counteract the eugenetic features of the war, and a campaign has been started, especially among the soldiers in the field, relating to such subjects as alcoholism, venereal diseases, and the desirability of a high birth rate.

Whether inheritance is always, as maintained by the Mendelians, alternative, or whether it may sometimes be a blending, is still an unsettled question. Castle thinks that in his mammals measurements and weights indicate a definite blending.

Stockard and Papanicolaou reported on a continuation of earlier experiments on the effects of alcohol on the animal body, and the inherited effect of the effects of alcohol. While the treated animals showed only a limited effect of the treatment, and were fairly healthy, their offspring displayed pathological conditions, and these were more marked in the grandchildren and great-grandchildren of the treated animals than in the animals themselves. This is not claimed as a demonstration of the transmission of an acquired character in the usual meaning of that term, but indicates a direct poisoning of the germ cells, which is transmitted to succeeding generations. Male offspring of alcoholized females are more affected than female, and conversely female offspring of alcoholized males are more affected than the male. This is in accordance with the "crisscross" inheritance of sex-linked characters (see above), and is to be explained by the peculiar behavior of the chromosomes in fertilization. Pearl followed Stockard's technique in administering alcohol and ether to domestic fowls, but in these animals got no indication of a germinal poisoning. These results he regarded as in no way contradictory to those of Stockard and Papanicolaou, but indicate that the fowl has a greater degree of resistance to this particular treatment than the guinea pig. See also EUGENICS.

**CYTOLOGY.** The belief that the chromosomes have some relation to the transmission of hereditary qualities has led to much research on these structures. Guyer, in the domestic fowl, found a chromosome whose appearance and behavior agree with those of the X chromosome in other animals, and the assumption that it has the functions usually assigned to an X chromosome seems to be borne out by the observed results of breeding. Apparently the male fowl is homozygous, and the female heterozygous for sex-linked characters.

Wodasdalek investigated the spermatogenesis of the mule, in an attempt at determining the reason for its sterility. The mule has 51 chromosomes, including an accessory, which Wodasdalek thought was derived from the horse. The horse has 37 chromosomes, indicating that the ass must have 65. The two sets of chromosomes in the body cells apparently function in a perfectly normal fashion, for the mule is long lived and vigorous in every way. When the chromosomes unite in the pseudo-reduction stage, abnormal forms appear, and the author was unable to find a single normal primary spermatocyte. As a result of these abnormalities no normal spermatozoa are produced, and as a consequence the animal is sterile.

Hoy studied the somatic chromosomes of the squash beetle, *Anasa*, to determine whether the number remains constant, and whether there is any ground for the belief that they are permanent cell organs. So far as this animal is concerned he thought that they are permanent and maintain a constant number and type. A study of the literature shows that this result has not been reached by all workers, and indeed there are contradictions in published observations, so that renewed study of this subject is desirable. This is especially so since the observed inconsistency in some forms has seemed to some to overthrow the whole chromosomal theory of inheritance. Similar work was done by Browne on the chromosomes of six species of *Notonecta* (the water boatman), where she found that the different species show constant differences from each other in chromosomal characters. Browne concluded that the results strengthened the belief that the chromosomes are important in determining the characters of the cells, though she was unable to determine the precise relation between particular chromosomes and particular bodily characters.

Cowdry thought that the focussing of so much attention on the chromosomes by cytologists has led to an unfortunate neglect of other cell structures, especially of the chondriosomes, which seem to have great importance in cell physiology, and may possibly play a part in heredity transmission. Wilson has studied these chondriosomes in scorpions, and finds that while some have a definite distribution like the chromosomes, others have not. Thus the question as to whether they carry hereditary qualities remains open.

Minchin discussed the evolution of the cell, stating his belief that the ordinary concept of the cell as given in text books, does not apply to the Protista, for among these we get all gradations from cases where the word cell can apply only by stretching its meaning, to cases where the organism is quite similar to the Metazoon cell. Minchin believed that the chromatin of the cell has a physiological predominance especially in constructive metabolism, specific individuation, and potential biological immortality. Hence the chromatin elements are the primary and essential constituents of living organisms. Thus we must conclude that the primitive organisms were biococci; free living organisms capable of building up their bodies by synthesis of simple chemical compounds. The nearest approach to these at the present day are the Chlamydozoa, which thus far have been seen to occur only as pathogenic parasites. From these primitive forms two types developed: 1. Vegetative type, where the body became surrounded by a rigid envelope and thus the bacterial type of organism arose, viz. a minute globule of chromatin surrounded by a firm envelope; 2. Around these chromatin particles appeared an enveloping matrix of protoplasm, which has amoeboid movements, and is able to form internal vacuoles. It is able to flow around food particles and digest them in the vacuoles, by the aid of enzymes secreted by the central particle (biococci). Thus is reached a stage which he calls "pseudomonera" because it resembles Haeckel's idea of a monera. The next stage in evolution was the organization of the chromatin grains into a nucleus as a definite cell organ, and this formed the starting

point for an infinite series of complications and elaborations in many directions.

**SEX DETERMINATION.** Whitney has stated (see YEAR BOOK for 1915) that feeding rotifers with a green alga, *Chlamydomonas*, resulted in an increase in the number of male producing females. Shull repeated these experiments and found that an increase of oxygen in the water has the same effect, and suggested that Whitney's results were in part due to the oxygen set free by the *Chlamydomonas* in photosynthesis. Moro, working also on rotifers, found that the addition of  $\text{FeCl}_3$  increased the number of male producers and also stimulated the animals to a more rapid production of eggs. Similar results followed the use of  $\text{HgCl}_2$ . Moro's general conclusion was that when conditions of diet and temperature are constant and uniform only female producers appear, but that if these conditions are suddenly modified male producers appear. Under the auspices of the Carnegie Institution of Washington, Riddle has continued researches begun on pigeons by the late Professor Whitman, and secured results which he thought explain the determination of sex in these animals. In a pure species of pigeons, the first of the two eggs in a clutch hatches into a male, while the second hatches into a female, the first egg also being smaller than the second.

In crossings of different families, the offspring are always males. Riddle stated that if animals of different genera are crossed, the offspring in the spring will be all males, and he implies that this would continue during the breeding season. If, however, the eggs be removed as fast as laid, and the female thus be kept at laying (is "overworked"), the offspring of later eggs will be female. Riddle thought this to be a real reversal of sex, and that it could not have either a selective fertilization or a chromosomal explanation. His interpretation was that in the male egg there is greater oxidizing capacity and greater metabolic activity than in the female, and that the overworking of the female brings about a change in eggs which otherwise would have developed into males so that they become female. The difference between the sexes then rests on modifiable metabolic levels of the germs. Males arise at higher, females at a lower, metabolic level and chromosomal conditions have nothing to do with sex determination.

**EVOLUTION.** Davenport adopted, in a modified form, Bateson's theory that evolution has progressed mainly through a dropping out of characters from a primitively very complex substance. He thought that while the organism as a whole is much more complex than the egg, the egg is much more complex than any single cell in the organism. Thus evolution is regarded as a series of internal changes chiefly independent of external conditions, and proceeding chiefly by a splitting up and loss of genes from a primitively complex molecular condition of the germ plasma. Davenport thought that this idea receives support from ontogeny, paleontology, and experimental breeding, and from analogy with studies on "rare earths" in inorganic compounds.

Observations on the problem of protective coloration were made by Beebe in Brazil. One very gaudy spider, *Acrosomo spinosa*, when disturbed, would slip under a leaf or feign death, thus

making no use of its "warning" coloration. Another form, *Epeira andas*, had what would be called a protective coloration, and lived more nearly up to the traditional behavior. Punnett thought that the so-called protective coloration of insects could not have arisen through natural selection because the chances are so much against any single variation having been preserved in this way, though chance variations might be preserved by selection after they have once arisen. Punnett suggests that in insects, as in guinea pigs and rabbits, there may be a limited series of factors producing color, and hence similarities arise because of similar combinations of these factors.

**SELECTION.** Jennings's earlier work on *Paramecium* had indicated that within the limits of a pure line, selection of extremes has no effect in raising or lowering the average of the descendants. This work was repeated by Ackert, who reached exactly similar conclusions. No differences could be observed between the descendants of long and of short *Paramecium*. Jennings, working on the results of selection in *Distugia* got results at variance with those thus far reached in the study of *Paramecium*. *Distugia* forms a shell having very definite markings, and selection on the basis of these markings showed that within a single family there might be produced extremes of variations in excess of anything which occurred originally. There is a definite inheritance of parental diversities, and a considerable degree of correlation between parent and offspring, though not as great as between the members of a population. These results were reached by a long series of measurements and computations, and are important as bearing on the question of "pure line" inheritance.

**VITALISM.** In some quarters there seemed to be a return to a vitalist explanation. Thus Neal argued for a vitalist position in explaining individuality in organisms, and Haldane maintained that "the attempt to analyze living organisms into physical and chemical mechanism is probably the most colossal failure in the whole history of modern science." Haldane cited cases like the regulation of breathing, the excretion of wastes and nutrition in general, where there is adaptation to unusual conditions as indicating that something more than physics and chemistry is at work in the body.

**PROTOZOA.** Schaeffer, on the basis of structure and reactions of *Amoeba*, decided that under the specific name *proteus* we have really several species, and described as new species two forms, retaining as *Amoeba proteus* the one corresponding to Leidy's description. *A. proteus* has longitudinal ridges and grooves on the pseudopodia. *A. dubia*, a new species, is distinguished from *A. discoides*, another new species, by the possession of an ovoid and a discoid nucleus respectively. Experiments on these forms showed that they will react to food materials, as has been earlier described, but also that they react in such a way as to send pseudopodia towards insoluble substances in the water, where, therefore, no chemical attraction could be in existence. Schaeffer noted that these reactions were as if the *Amoebae* could see the object at a distance, though he is careful not to make such an interpretation.

Woodruff and Erdmann, who had previously worked on nuclear reorganization in *Paramecium*



*cium aurelia* (see YEAR BOOK for 1914), continued these experiments on *P. caudatum* and found exactly similar conditions to those obtaining in *aurelia*. Their conclusion was that under favorable environmental conditions conjugation is not essential for the continuation of the life of the race.

An important publication of the year was the completion of *British Fresh Water Rhizopoda and Heliozoa* by Cash and Wailes.

**ARTHROPODS.** Pearse found that fiddler crabs use their large claws both for fighting and for signaling the females. In going into their burrows they usually close the opening with a bit of dirt, the method varying with the hardness of the available material.

Hegner, experimenting on the eggs of potato beetles, concluded that they are laid on the under side of leaves for protection from sunlight rather than from enemies. In beetle eggs his experiments indicated that the main features of development which determine the phylum, the class, and order, are determined by the cytoplasm, the chromosomes determining the minor characteristics. Gynandromorphic insects, which are partly male and partly female, were explained some years ago by Boveri as due to a peculiar fertilization of the egg. He assumed that the egg divided before the sperm had fused with the egg nucleus, and in consequence one cell contained only female nuclear matter, while the other contained both male and female. An alternative explanation offered by Morgan was that more than one sperm had entered the egg, and that some cells contain only sperm nuclei, while others contain both. In the former case all male parts would be maternal and all female parts paternal, while the reverse would hold in the second interpretation. An examination by Morgan of the "engster" gynandromorphs showed that they can be explained on Boveri's original hypothesis.

**PLATYHELMINTHES.** Ball described the development of *Paravortex gemellipara*, a small rhabdocoele turbellarian living as a commensal in the mantle cavity of mussels. Here, as in other capsule forming rhabdocoeles, two or more embryos arise in each capsule by the enclosure of two or more eggs and about 100 yolk cells in the shell. The chondriosomal mass (see *Cytology* section) was traced from the young oocyte to its final resting place in the primary entoderm cells. It probably has to do with the digestion of the vitelline yolk by these cells. What seems not to have been recognized in other Turbellaria occurs here, in the appearance of

three primary germ layers, mesectoderm, primary entoderm, and secondary entoderm. The eye appears very early in ontogeny, which may be explained by saying that since it is composed of only one cell it is early separated from others, and differentiation is easy.

**FISH.** Much excitement was caused in the summer of 1916, by the attacks of fish on bathers along the New Jersey coast. No animal was definitely identified as the aggressor, but it probably was a shark, though in spite of its reputation, the shark very rarely attacks human beings. One of the few species that do thus attack is the white shark, *Carcharodon carcharias*, and the capture of one of these in this vicinity led to the belief that it might have been the individual involved. Schmidt found that the European eel, which is distinct from both the American and Japanese forms, appears in several races, but that these differ in number of vertebrae much less than do the blennies. He suggested that this might be due to the fact that eels have a common breeding place, while blennies breed in restricted localities; thus each variety varies along its own line without chance of interbreeding.

**AMPHIBIA.** It was discovered that the alligator salamander *Autodas lugubris*, of the Pacific Coast region, lives in holes in hollow trees often at considerable heights, using its toes and prehensile tail as climbing organs. The larval stages are passed through in the egg.

**AVES.** Beebe, in British Guinea, describes the Hoatzin as very limited in its movements, so that individuals can always be found in certain definite places. The nests, which are sometimes solid and sometimes very loosely constructed, are always built over water, at a height of from 4 to 40 or 50 feet. Young birds, a week old, if disturbed would climb to the edge of the nest, and dive overboard into the water without any reference to the height of the nest from the water. They gradually make their way back, using the wings as climbing organs. Beebe commented on the reptilian appearance of the young birds with their separate fingers and long neck, and this resemblance is heightened by the diving habit. In 1909 the Duke of Bedford gave six yaks to the Canadian government. In 1916 they had increased to 14. It was reported that there is reasonable hope that they may form the nucleus of a breed of hardy cattle for the North. See also ENTOMOLOGY; FISH AND FISHERIES; ORNITHOLOGY.

**ZULULAND.** See SOUTH AFRICA, UNION OF. Zululand is administered under Natal.

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